

# NETWORK WORLD

The Newsweekly of User Networking Strategies

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## Developers dump hosts for PC LANs

By Susan Breidenbach  
West Coast Bureau Chief

Up until 1985, Nova Biomedical Corp. did all its software development on a minicomputer. Today, the company's programmers work on 35 personal computers linked in a local network with three file servers.

Dave Dalke, manager of software development for the firm's Alpha Products Group, says he wouldn't go back to the minicomputer development environment for anything.

Nova Biomedical, based in Waltham, Mass., is among a growing number of users that are shifting software development efforts away from large host systems to local networks. These users are lured by the power and graphics capabilities of intelligent workstations and the increasing availability of automated software development tools.

"That's the trend we've seen over the past two years with our clients — away from hosts and toward LANs," said Hal Spice, president of Stockton, Calif.-based Telesis Consulting Group, which provides consulting services to large companies with in-house software development teams.

Spice sees corporations looking at the mainframe as a data depository, a huge disk drive from (continued on page 52)



NCR Comten execs Ken Brantley (left) and Ron Groenke show off the inner workings of the company's new 5675 front-end processor.

## NCR Comten delivers new front-end processor line

Vendor challenges IBM's 3745 and 3725 FEPs with redesigned versions of its older 5660 line.

By Paul Desmond  
Staff Writer

NEW YORK — NCR Comten last week raised the stakes in the front-end processor market with the introduction of a new product line that, at the high end, offers more than twice the processing power of comparable IBM front ends, according to the company.

The processors, the 5655, 5665 and 5675, will compete with IBM's mid-range 3725 and both models of the top-of-the-line 3745, the Model 210 and Model 410. The processors offer increased mainframe channel support and more direct T-1 terminations than the IBM units, NCR Comten said.

The processors, announced at Interface '89 Plus here, are based on the company's older 5660 architecture, and they support the same software. But the new models take up only half the floor space of the 5660 and use 26% less power.

The number of potential points of failure has been reduced by cutting the number of printed circuit boards nearly in half and by reducing the number of interconnect cables by 54%.

Models in the new line are distinguished by the number of lines they support and other capabilities. The 5655 has 8M bytes of memory and supports as many as (continued on page 55)

## FCC shakes off past, OKs caps for AT&T

In fundamental shift of regulatory policy, FCC approves controversial price cap plan for AT&T.

By Anita Taff  
Washington Bureau Chief

WASHINGTON, D.C. — The Federal Communications Commission last week voted to implement the controversial price cap regulatory scheme for AT&T starting July 1, but it deferred a final decision on price caps for local carriers until at least 1990.

FCC Chairman Dennis Patrick, who championed the plan, said approval of price caps is an important step on the long road to regulatory reform. "This represents a major milestone — a major transition in our approach to the regulatory process," he said.

Patrick claimed that during the first four years of price caps, consumers will save \$900 million compared to what they would have spent under rate-of-return regulation. In the long run, he said, "we're going to create an incentive environment that will reveal exactly how efficient [this industry] can be."

But the reactions of users, analysts, AT&T and even the FCC itself indicate no one is completely happy with the plan. Owing to pressure from Congress, the plan had been modified to include provisions aimed at protecting consumer interests.

Users groups last week said the changes do not go far enough,

while the FCC's Patrick, AT&T and analysts said the modifications restrict AT&T's pricing flexibility too much.

Among the most important (continued on page 53)

### INSIDE



AT&T Chairman and CEO Robert Allen kicks off Interface '89. Story on page 6.

## US Sprint reveals ISDN rollout plan

By Bob Wallace  
Senior Editor

BOSTON — US Sprint Communications Co. last week revealed its Integrated Services Digital Network deployment plans at a private briefing for 150 current and prospective customers here.

The carrier said it will finish equipping its network switches to support ISDN early next year and will tariff an ISDN Primary Rate Interface service shortly thereafter.

Introduction of ISDN Primary Rate Interface service would give US Sprint a boost in its race with AT&T, which became the first long-distance carrier to offer ISDN when it launched its Primary Rate Interface service in April 1988. MCI Communications Corp. said it will announce ISDN (continued on page 54)

### NETLINE



**AT&T OFFERS DRASTIC** price cuts on Accunet switched data services. Page 2.

**MAJOR USERS GROUPS** join forces to speed the advent of OSI and ISDN products. Page 2.

**SEARS SIGNS** with US Sprint, rejecting a Tariff 12 bid from AT&T. Page 3.

**DEC AND NORTHERN TEL** showcase new voice/data applications. Page 3.

**CEBIT '89 HOSTS** a raft of multivendor networking demonstrations. Page 6.

**AS LOCAL NETS EXPAND**, their appetites for support grow too. Page 39.

### FEATURE

## Peripherals assume role of multiuser servers

By Jeffrey Horn  
Special to Network World

As local networks assume the role of hosts — often working side by side with minicomputers and mainframes — personal computers and their peripherals are evolving from a single-user orientation to become multiuser servers.

Minicomputer and mainframe peripherals have always been well-suited to the depart-

mental environment. Now personal computer peripherals that are hung on a local net must not only serve many users at a time, they must do so in the more distributed peer-to-peer environment of the local network.

Many computer peripherals that had been dedicated to a single-user machine are now touted as designed for multiuser applications on a (continued on page 35)

MANAGEMENT

UPDATE



# AT&T files tariff plan with FCC to slash Accunet rates

The carrier moves to reduce rates in response to MCI and US Sprint's low-priced services.

By Gail Runnoe  
Washington D.C. Correspondent

WASHINGTON, D.C. — AT&T last week said it plans to lower prices on its Accunet Switched Digital Services by as much as 74% next month.

The proposed price reductions on AT&T's 56K bit/sec and 64K bit/sec Accunet data services are in response to the availability of lower priced switched data services from rivals MCI Communications Corp. and US Sprint Communications Co. The Federal Communications Commission must approve AT&T's price cuts before they can go into effect.

In its proposed tariff revision, AT&T told the FCC it could lose as much as 70% of its switched 56 service revenue in 1989 to cut-rate competitors if its rate reductions are not promptly implemented. AT&T requested that its new rates take effect on April 18.

US Sprint and MCI claim their switched 56K bit/sec services are currently priced 78% to 88% lower than AT&T's Accunet Switched 56 prices ("Switched 56 alters rules of the game," *NW*, Feb. 27).

Steve Kropper, a telecommunications analyst at International Data Corp. in Framingham, Mass., said AT&T's rate cuts are

required. "While I don't think the lower switched 56 rates will make AT&T more competitive than MCI or Sprint, I do think that if they hadn't lowered their prices, they would have been hurt," he said.

One Accunet switched 56 user, FMC Corp., a Dallas-based equipment and manufacturing firm, has been scouting other vendors for better prices. However, according to Robert Keller, FMC's manager of planning and analysis, if the proposed AT&T rates are approved, there will be "no reason to look at other carriers."

Under the AT&T plan, the company will lower rates for both high-volume users on the Accunet optional billing plan and lower volume users on the standard billing plan.

Usage charges for the Accunet standard plan, which currently range from 35 cents to \$1.08 per minute after the first 30 seconds, would be reduced to between 11 cents and 30 cents per minute. The rates vary according to the distance of the call.

Usage charges under Accunet's optional calling plan would plunge from a range of 26 cents to 81 cents per minute to a range of 8 cents to 23 cents per minute

(continued on page 8)

## COS, MAP/TOP group unite to push standards in 1989

ANSI and NIST will also spur OSI and ISDN use.

By Bob Brown  
Senior Writer

MCLEAN, Va. — The Corporation for Open Systems (COS) and the North American MAP/TOP Users Group recently agreed to join forces with two other groups to speed the introduction of OSI and ISDN products.

COS and the North American MAP/TOP Users Group have agreed to coordinate their efforts throughout 1989 concerning Open Systems Interconnection and Integrated Services Digital Network products.

The groups said they will also work closely with the National Institute of Standards and Technology (NIST), a Department of Commerce agency dedicated to standards, and ANSI, the U.S. representative to the International Standards Organization.

Together, the groups will work to harmonize conformance-testing, specification and certification procedures, said Lincoln Faurer, COS president and chief executive officer.

COS focuses on the development of conformance tests for

standards-based products.

High-level representatives from each of the four groups have met twice so far and plan to meet for a third time within the next month, said Charles Gardner, chairman of the Steering Committee of the MAP/TOP Users Group and manager of supplier and standards management at Eastman Kodak Co. in Rochester, N.Y.

At their most recent meeting, the groups' representatives approved a charter outlining goals for them to work on together and drew up a list of common problems, Gardner said. The list, addressing about a dozen problems, has not been made public.

"All of our organizations have met and collectively agreed on the value of acting cooperatively," Faurer said.

"We intend to continue our meetings through 1989, particularly because this year is viewed with increasing clarity by all parties as the year when interoperable, multivendor OSI and ISDN products" will make their first big

(continued on page 8)

## Briefs

**Utilities hold power rally.** Dozens of electric utility companies and network vendors will hunker down this week to begin thrashing out a communications standard for the industry that will be partially based on the Open Systems Interconnection protocol suite.

Network managers from the Tennessee Valley Authority, Pacific Gas & Electric Co., Houston Lighting & Power Co. and Consolidated Edison Co. of New York, Inc. will be among the utilities gathering in St. Charles, Ill., to form a communications specification tailored for their real-time process control environments. The data communications specification will be a guideline for vendors to design and build communications products for utilities.

The meeting will be sponsored by the Palo Alto, Calif.-based Electric Power Research Institute (EPRI) and Andersen Consulting of Chicago, a division of Arthur Andersen & Co. EPRI, an independent research and development group serving the electric power industry, awarded Andersen Consulting a \$1.4 million contract last December to help devise the emerging utilities communications architecture.

**COS says yes to ISDN demo.** The Corporation for Open Systems last week agreed to co-sponsor a conference and exhibition in 1991 with the North American ISDN Users Forum to demonstrate Integrated Services Digital Network products.

During a meeting of the ISDN Users Forum last week, Ron Aitchison, head of the committee planning the conference, said the group is seeking addi-

tional sponsors and has approached both the International Communications Association and the National Computer Forum. The ISDN group will also target 16 corporate sponsors for the event, according to Aitchison. Although he declined to specify which companies would be asked, he said the group would include local exchange carriers, interexchange carriers and major switch manufacturers.

**Infotron plans OS/2-NetWare ties.** Infotron Systems Corp. of Cherry Hill, N.J., said last week it is developing software to link OS/2-based networks with Novell, Inc. NetWare local nets.

The software will enable OS/2 networks to share files, electronic mail and peripherals with NetWare-based Ethernets, according to George Greene, president and general manager of the company's LAN Systems Division. The software will be packaged as an option to Infotron's Commix 32 communications server, Greene added. The OS/2 software option for the Commix 32 server is expected to ship in early 1990.

**In Greene we antitrust.** In an address at the New York Law School last week, U.S. District Court Judge Harold Greene confirmed his beliefs about the benefits of enforcing antitrust law. Greene, who oversaw the breakup of AT&T and now monitors the Consent Decree, said antitrust law is to the economy what the Bill of Rights is to the Constitution. "I become somewhat worried," Greene said, "when information-type companies become so big that they overwhelm everyone."

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Although network products come into being through the use of highly advanced technology, many companies employ rather unscientific methods for naming those products. **Page 9**

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IBM throws its full support behind the used switch mart with the creation of a nationwide plan to certify, install and maintain used Rolm PBXs. **Page 13**

### Data Communications

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Network World  
Box 9171, 375 Cochituate Road  
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# Sears picks US Sprint as primary carrier, rejects AT&T Tariff 12

By Bob Brown  
Senior Writer

CHICAGO — In a multimillion-dollar deal, Sears Technology Services, Inc. last week named US Sprint Communications Co. its primary voice network carrier after rejecting a Tariff 12 bid from AT&T.

The agreement will make Sears Technology Services — the corporate information organization of Sears, Roebuck and Co. — one of US Sprint's largest accounts. US Sprint will replace AT&T as Sears' primary carrier.

Neither US Sprint nor Sears would re-

veal many details about the contract, including its value. They said, however, that Sears will use a variety of US Sprint services, possibly including its Virtual Private Network.

## Similar to Tariff 12

Sources familiar with the agreement described the Sears deal as a "Tariff 12-like" custom network arrangement akin to those AT&T has offered to such users as General Electric Co. and American Express Co. As with those agreements, US Sprint has offered Sears the ability to procure a

range of services under a single contract at a fixed price.

Sources said US Sprint's bid beat out a Tariff 12 custom net offering from AT&T and a bid from MCI Communications Corp. in terms of price and quality. The sources would not disclose details of AT&T's Tariff 12 plan.

Officials of Sears would not comment on whether AT&T had offered a Tariff 12 network plan. AT&T refused to acknowledge its participation in the bidding process, citing a company policy against commenting on contracts for which it has not filed a tariff.

The contract, which is actually a significant expansion of a 1986 agreement between US Sprint and Sears, calls for the carrier to provide voice services to some 20,000 locations of Sears and its subsidiar-

ies, including Allstate Insurance Co. and the Dean Witter Financial Services Group.

## Redundancy measures

Sears will maintain its practice of using a variety of carriers to ensure network redundancy, a spokesman for the retailer said. Under the terms of the contract, Sears will begin migrating existing switched traffic to US Sprint and will begin moving voice traffic carried on the company's private T-1 backbone net to US Sprint's public network, sources said.

The T-1 backbone, which will continue to carry data traffic, currently supports both voice and data.

The T-1 backbone also anchors the Sears Communications Network, which supports net services marketed by Sears  
(continued on page 55)

# DEC, NTI show off integration of VAXes, SL-1s

By Bob Wallace  
Senior Editor

BOSTON — Digital Equipment Corp. and Northern Telecom, Inc. last week hosted an event to showcase a raft of new integrated voice/data applications designed to link DEC VAX minicomputers and Northern Telecom Meridian SL-1 PBXs.

The applications, developed by independent firms, support telemarketing and customer service operations. They represent the second round of applications to come out of DEC's 17-month-old Computer Integrated Telephony (CIT) program.

The applications, which functionally integrate voice and data, are intended to enable users to boost productivity by speeding call handling and data base lookups. CIT-compatible switches can operate with stand-alone VAXes or with VAXes linked in a DECnet local network.

DEC launched the CIT program in October 1987 at the Telecom '87 conference and exposition in Geneva with the debut of an application program interface designed to simplify development of VAX-to-private branch exchange links.

A number of switch vendors endorsed CIT at the Telecom '87 announcement, including NEC America, Inc., Siemens AG and Ericsson, but only Northern Telecom and British Telecommunications plc have announced CIT applications.

British Telecom introduced applications for its Regent Generic 257 PBX in January 1989.

Analysts said the CIT program may spur development of integrated voice/data applications, but they were disappointed to see that only three of six CIT application developers bothered to demonstrate their wares at the DEC announcement.

"The demonstrations were not extensive, and DEC had no proof that they had done any market testing of the packages," said Jeffrey Kaplan, network and professional services director for The Ledgeway Group, Inc., a consulting and research firm based in Lexington, Mass.

William Johnson, DEC's vice-president of distributed systems engineering and marketing, predicted that more than 100 independent software vendors will have announced or be working on CIT applications by March 1990.

(continued on page 8)



## Some businesses are just learning it exists. Others may not be able to exist without it.

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McDonald's faced a challenge. They were spending too much time and resources maintaining 21 different communications networks, rather than on what they do best: selling hamburgers.

And McDonald's is growing at the rate of one new restaurant every 17 hours.

As Bonnie Kos, McDonald's VP for facilities and systems, put it, "We had to adapt a single approach to all our communications that not only got rid of all our network spaghetti, but allowed us easy connectivity and communications between computers that use different protocols."

The approach they chose was ISDN.

Ameritech's Illinois Bell, in conjunction with AT&T Network Systems, and using a 5ESS® switch, used ISDN to allow McDonald's to migrate to a single, integrated, all-digital network.

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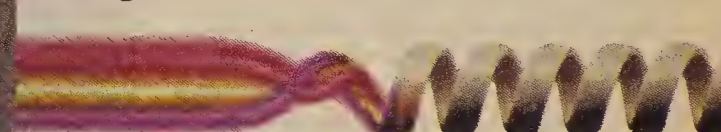
But, the advantages of ISDN go beyond simplifying and connecting McDonald's communications network.

**"ISDN will allow us to get rid of our network spaghetti and concentrate on selling hamburgers."**

ISDN will soon allow the company to access more current market data, quickly track product promotions, streamline inventory control and reduce administration workloads. All this means more time to spend one-on-one with the most important part of McDonald's business—the customer.

Even now, McDonald's is using such advanced ISDN features as calling number identification, electronic directory, and high-speed, high-quality facsimile transmission without dedicated lines.

As Bonnie Kos summed it up, "ISDN is letting us do a lot more with a lot less."



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The right choice.



# AT&T CEO Allen says users hold the power in network industry

Calls for cooperation on standards in Interface '89 keynote.

By Paul Desmond  
Staff Writer

NEW YORK — AT&T Chairman and Chief Executive Officer Robert Allen said last week that users have more influence than ever in determining vendor strategies and are wielding that power to shape the industry.

During his keynote address at Interface '89 Plus here last week, Allen said the movement toward distributed computing, spawned by the proliferation of microcom-

puters, has led to an increased demand for standards.

While urging vendors to cooperate in establishing standards, Allen extolled the virtues of AT&T's Unix System V as an industry standard as opposed to the IBM AIX-based version being promoted by the Open Software Foundation (OSF). Unix System V is backed by the AT&T-led Unix International, Inc.

But Allen added that he believes Unix International and OSF will work together

in the future. "It's in our industry's interest to get our act together and give [users] a clear, broad path. I think we will. We at AT&T want to. I think the companies will settle their differences."

Allen's speech kicked off the 17th annual Interface show. His references to standards and distributed computing underscored the themes of several sessions at the show, including one in which an IBM executive outlined the company's intention to make its Systems Network Architecture and Systems Application Architecture (SAA) compatible with other network architectures, including the Open Systems Interconnection model.

"User needs are driving our industry to a degree we've never seen before," Allen said. "Competition and technology have brought a major shift in the balance of

power from vendors to users."

Taking advantage of that power, users are demanding greater value from their investments in information systems and asking for help in dealing with their complex nets. Allen said users need assistance in using information technology to optimize operations, not just to automate them. Users are also demanding standards to make their machines work together.

"Standards shift the focus of competition to where it belongs — away from the artificial restrictions created by proprietary systems and toward meeting specific user needs," Allen said.

AT&T clearly wants Unix System V to be accepted as a standard Unix version. Unix International, a consortium of companies that has taken over development of the operating system, has laid to rest claims that

## Multivendor net demos top bill at CeBIT expo

HANNOVER, West Germany — Judging from the number of multivendor networking demonstrations at CeBIT '89, the mammoth computer and communications trade fair that ended here last week, users' cries for open systems have been heard.

Few new products were unveiled at the exhibition (see "West Germany touts ISDN services at CeBIT '89 show," page 13). But sheer size makes CeBIT a bellwether of industry trends. Each year, an international crowd of users flocks to the world's largest information technology show to get a sense of which way the winds are blowing in this unpredictable industry.

One thing was clear from CeBIT '89: The standards movement is gaining momentum. Three separate demonstrations at CeBIT showcased the interoperability of products from different suppliers.

At the MultiNET demonstration, beer flowed and a band played polkas as 35 firms linked their Transmission Control Protocol/Internet Protocol-based products over an Ethernet backbone. All products that were demonstrated are currently available. Among the vendors participating in the MultiNET demo were Apple Computer, Inc., Digital Communications Associates, Inc., Hewlett-Packard Co., Siemens AG, 3Com Corp. and The Wollongong Group, Inc.

In what was billed as the highlight of the presentation, 10 of the firms demonstrated gateways to Open Systems Interconnection X.400 messaging services supported by the Deutsche Bundespost's X.25 packet-switching network.

MultiNET's organizers cited this TCP/IP-to-OSI interoperability as proof of the vendors' support for OSI. However, some vendors, including IBM and Digital Equipment Corp., declined to participate in the MultiNET exhibition because of what both said was an overemphasis on TCP/IP. They said strong support for TCP/IP, a de facto industry standard, could slow acceptance of OSI-based products.

"Some companies said it could discourage customers from switching from TCP/IP to OSI in the future," said MultiNET organizer Hubert Martens. "But we wanted to show customers they can integrate systems using some protocol, whatever it is."

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# How to test a sophisticated network:



AT&T would gain an unfair advantage by developing Unix on its own, Allen said.

Allen said Unix System V Release 4 would be delivered "as early as the third quarter this year, long before OSF can deliver its version."

In the session on SNA and SAA, Mark Pozefsky, manager of communications systems architecture at IBM, said IBM is opening up SNA and SAA to support communications with other architectures.

IBM's Common Programming Interface for Communications (CPI-C) will play a large role in that effort by providing a common application interface, regardless of architecture or operating system, Pozefsky said. A user on an SNA network could work with an application on an OSI network, and CPI-C would handle any translations. ■

## Microrim puts plans on table for relational DBMS software tools

Atlas offerings help users develop corporatewide systems.

By Jim Brown  
New Products Editor

REDMOND, Wash. — Microrim, Inc. last week detailed plans to offer a set of software tools designed to enable users to develop corporatewide distributed relational data base management systems.

As part of a project code-named Atlas, the company said it will build an SQL-based relational DBMS that can run on microcomputers, minicomputers and mainframes. The company will also develop

software linking its DBMSs to other vendors' DBMSs, allowing users to access data stored on a variety of computers in a network. Atlas products will support a variety of network schemes, including Transmission Control Protocol/Internet Protocol, Microsoft Corp.'s OS/2 LAN Manager, IBM's Systems Network Architecture and Digital Equipment Corp.'s DECnet.

With Atlas, users will be able to implement a single DBMS capable of retrieving and updating data stored in various

DBMSs. Other vendors' distributed data base strategies require users to implement a common DBMS on all systems and modify existing data bases for compatibility, which is an ungainly proposition.

"If I have to change my data, I'm talking about a big task fraught with all sorts of danger," said Fred Thorlin, director of software industry service at Dataquest, Inc., a San Jose, Calif.-based market research firm. Atlas "will be able to fit with what users already have in place."

Other analysts agreed. "People don't want to trash what they've got," said Nancy McSharry, manager of the PC program for International Data Corp., a Framingham, Mass.-based market research firm. "The people at Microrim realize that and are saying the way to get around that is to develop a gateway approach."

Microrim will provide four Atlas components: Atlas Compiler, Atlas Surface, Atlas Database Engine and Atlas Data Connections.

Atlas Compiler software enables users to build applications using a fourth-generation language and menu-driven commands. Those applications run under Atlas Surface software. Atlas Surface is client software with a graphical user interface that enables customers to build data requests using menu-driven English language commands. Those data requests are transparently converted to ANSI SQL format and processed by a local Atlas Database Engine or forwarded to an Atlas Database Engine on another machine.

Atlas Database Engine software running on such devices as a local network file server, minicomputer or mainframe supports data management functions and a dynamic global data dictionary that keeps track of where data is stored and which DBMS manages access to that data base.

In addition to supporting data management functions, Atlas Database Engine can establish application-to-application links with Atlas Data Connections software running on minicomputers or mainframes.

Atlas Data Connections enables users to access data supported by other vendors' DBMSs by converting SQL commands to the command syntax of the target DBMS.

The first Atlas DBMS, a server-based product supporting Microsoft's OS/2 Presentation Manager and LAN Manager, is scheduled to ship by year end. Other products due out over the next 18 months are:

- Atlas Compiler software that lets users develop applications for OS/2 microcomputers, Apple Computer, Inc. Macintoshes, DEC VMS- and Ultrix-based minicomputers, Sun Microsystems, Inc. workstations and IBM AIX-based mainframes.

- Atlas Surface software supporting Microsoft's OS/2 Presentation Manager, DOS Windows, Apple's Macintosh, Sun's Open Look and DEC's DECwindows graphical interfaces. IBM mainframe versions will not support a graphical interface.

- An OS/2-based Atlas Database Engine supporting read and write access to data stored in a microcomputer-based Atlas DBMS, Microrim R:BASE DBMS, Ashton-Tate Corp. dBase DBMS or IBM Extended Edition Data Base Manager. Other Atlas Database Engines will run on VMS- and Ultrix-based DEC VAXes, Unix-based minicomputers, Sun workstations and IBM hosts running AIX, MVS or VM.

- Atlas Data Connections software providing links from Atlas DBMSs to Oracle Corp.'s Oracle, Relational Technology, Inc.'s Ingres, DEC's Rdb, IBM's DB2 and SQL/DS, Informix Software, Inc.'s Informix and Concurrent Computer Corp.'s Unify DBMSs. ■

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through another route when a connection is broken, and even more important, how long it takes to reroute multiple calls (can the network handle multiple reroutings simultaneously?).

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# AT&T, others offer wealth of ISDN products at demo

By John Cox  
Senior Editor

SCOTTSDALE, Ariz. — AT&T last week demonstrated a battery of new and existing Integrated Services Digital Network products at NetPower '89, an exhibition designed to show how businesses can exploit ISDN Centrex service.

More than 50 hardware and software vendors participated in the exhibition, which showed a mix of products linked via ISDN Basic Rate Interfaces in simulated business settings, according to Michael Vogel, switching sales support director with AT&T Network Systems Group.

Only a few of the products demonstrated were new, and most of those were designed to enable users to network microcomputers via ISDN Centrex.

Progressive Computing, Inc. of Oak Brook, Ill., introduced ISDN tel/adaptor, an interface board for IBM and compatible microcomputers that supports ISDN's Basic Rate Interface.

The product lets users transfer files and support multiple virtual terminals while simultaneously supporting advanced ISDN voice

features such as Incoming Calling Line Identification. Priced at \$995, the product will be available in April.

NetLine, Inc. of Provo, Utah, introduced ManyLink for ISDN, which is microcomputer software that enables microcomputer users in ISDN Centrex networks to share printers, transfer files and do simple messaging.

The product, which is for IBM-compatible computers running MS-DOS 3.0 or above, has a menu-driven user interface and costs \$245 per workstation. It is available now.

Also introduced was a 64K bit/sec ISDN version of R-Server from Solana Electronics of San Diego, Calif. Previously available for use with lower speed modem connections, the new product links Apple Computer, Inc. AppleTalk networks over ISDN connections. The device sits on an AppleTalk net and attaches to an AT&T 7506 ISDN telephone set.

A single building can have several R-Servers, each supporting AppleTalk networks and allowing remote sites to share central network resources, according to David Crellen, Solana's president.

The ISDN R-Server is priced at \$995 and is available now.

Other vendors used NetPower to announce ISDN Basic Rate Interface support for existing products. Among them were The Software Link, Inc. of Norcross, Ga., which announced PC-MOS/386, an operating system that lets Intel Corp. 80386-based microcomputers work as hosts for microcomputers and dumb terminals in an ISDN network.

The Software Link also detailed PC-Emulink, a terminal emulation package for workstations in a PC-MOS/386 network that will be released in May with ISDN support and new features such as file transfer.

Baxter Healthcare Corp. of Northbrook, Ill., used the show to announce ISDN Basic Rate Interface support for its AnnsionLink software, a package that manages the exchange of patient information between hospital information systems and physicians.

AT&T created a series of simulated business settings at NetPower to demonstrate the applications. One demonstration simulated an MIS help desk, using ISDN connections to troubleshoot computer and network problems. Another simulated a purchasing department, using ISDN to track inventories, communicate with vendors and manage receivables. ■

## COS, MAP/TOP group unite

continued from page 2

splash in the U.S., he said.

The meetings will provide for high-level planning and will "minimize duplication of effort and conflict among our respective organizations," Faurer added.

The groups will meet every few months with the objective of encouraging dialogue among the different parties, Gardner said. It is possible that more groups will join the charter members of the group in the future, Gardner said. It is unlikely, however, that the group, which has been tentatively named the "Roadmap Group," will develop into a freestanding organization, he said.

A major reason for the groups

to unite is to keep pace with their counterparts in Europe and Japan, Gardner said. The European Economic Commission and Japan's Ministry of International Trade and Industry have helped to coordinate efforts of standards-oriented groups overseas, he said.

"The kind of structure evident in Europe and Japan does not exist in the U.S.," Gardner said. "This is a step in that direction."

While Gardner did not say that pressure from outside observers forced the groups to set up a formal cooperative agreement, dissatisfaction among group members was a factor, he said.

"We all feel the process does not move fast enough to satisfy any one of us," Gardner said. "One way to speed the process up is to collaborate." ■

## DEC, NTI show off integration

continued from page 3

To use the integrated applications, customers need a VAX equipped with DEC's VMS CIT Server Software and VMS CIT Application Interface software. The server software costs \$3,000, and the interface software ranges in price from \$450 to \$14,250, depending on the hardware configuration. Both packages run on DEC's VAX, MicroVAX, MicroVAX II and VAXstation processors.

In addition, customers must purchase Northern Telecom's ISDN/AP software, which runs on SL-1s equipped with Generic X.11 Release 13 switch software. The ISDN/AP package costs \$10,000 to \$20,000, depending on the SL-1 model used.

The synchronous RS-232 or RS-422 data link from the VAX hooks to an Enhanced Serial Data Interface (ESDI) in the SL-1. Each ESDI card costs \$1,045. The DEC software is expected to be available next month, and the Northern Telecom software is available now.

Companies that announced applications at the DEC-Northern Telecom event included:

■ National Political Resources, Inc. of Alexandria, Va., introduced TeleTech Link Version 1.1, software that enables customers

to use computer terminals to dial telephone numbers, monitor activity on an extension and answer, transfer or disconnect calls. The software, which lets users design screen presentations, costs \$1,000 per workstation.

■ Shared Medical Systems' Turnkey Systems Division, based in Oakland, Calif., developed Allegra Physician Link software, an electronic mail service that doctors can use to access patient records. The software ranges in price from \$500,000 to \$1 million and will be available in June.

■ The Data Group Corp., based in Burlington, Mass., created Fieldwatch, which identifies callers, retrieves the calling customer's file from a data base and displays information on a dispatcher's screen. The software can be ordered beginning in September. Pricing starts at \$40,000.

■ Business Systems Resources of Waltham, Mass., introduced Advance Phonathon module software for use by colleges and universities in their fund-raising efforts. The software automatically queues prospective records and provides the telemarketer with background information on the party to be called.

## AT&T files tariff to slash rates

continued from page 2

after the initial 30-second period. Monthly charges for the optional calling plan would also be reduced 29% to 50%, from between \$175 and \$400 to between \$82.50 and \$225. Monthly charges also depend on aggregate call distance. One group of rates that would experience the maximum 74% reduction would be those calls made within a 22-mile range under either the standard or the optional plan.

In the District of Columbia and the 21 states in which direct-dial access to Accunet services is available, AT&T will shave an additional five cents per minute from the usage charges.

AT&T said the rate reductions were made possible by routing fa-

cilities that ensure Accunet traffic is carried over digital facilities. Originally, it was forced to dedicate digital circuits in order to prevent Accunet traffic from being routed over analog trunks.

If the rate reductions are approved, AT&T believes its gross service revenue for Accunet Switched 56 service could total \$14.74 million in 1990. The company declined to compare that projection to revenue estimates for this year.

Although some AT&T DDS and private-line customers are expected to switch to Accunet service if the lower rates are approved, AT&T would still see an overall revenue increase of \$6.1 million in 1990 for total inter-

state services, a spokeswoman said.

Jane Laino, president of Corporate Communications Consultants, Inc. in New York, said it is not likely that a large group of users will migrate from private-line to switched data services. Many users still perceive private-line service as offering greater reliability, she said.

Competing vendors said they are not concerned about the AT&T rate plan. A spokesman for MCI said that the company believes its 56 Kilobit Switched Digital Service rates are still competitive with the proposed AT&T rates and MCI has no plans to lower its rates in response.

A spokesman for US Sprint said, "All [AT&T's rate revision request] says is that their rates were too high to begin with." ■

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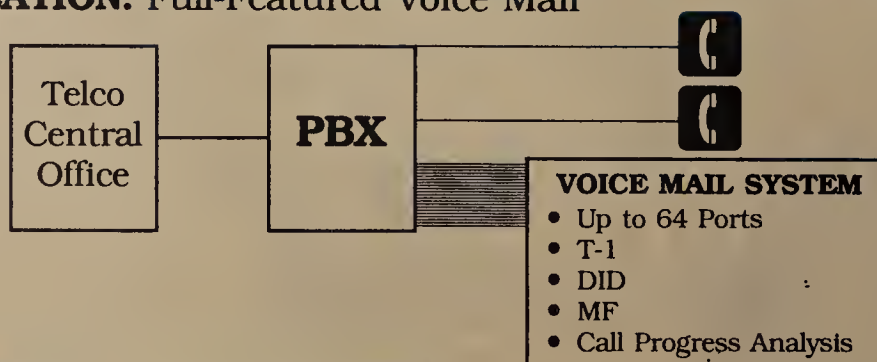
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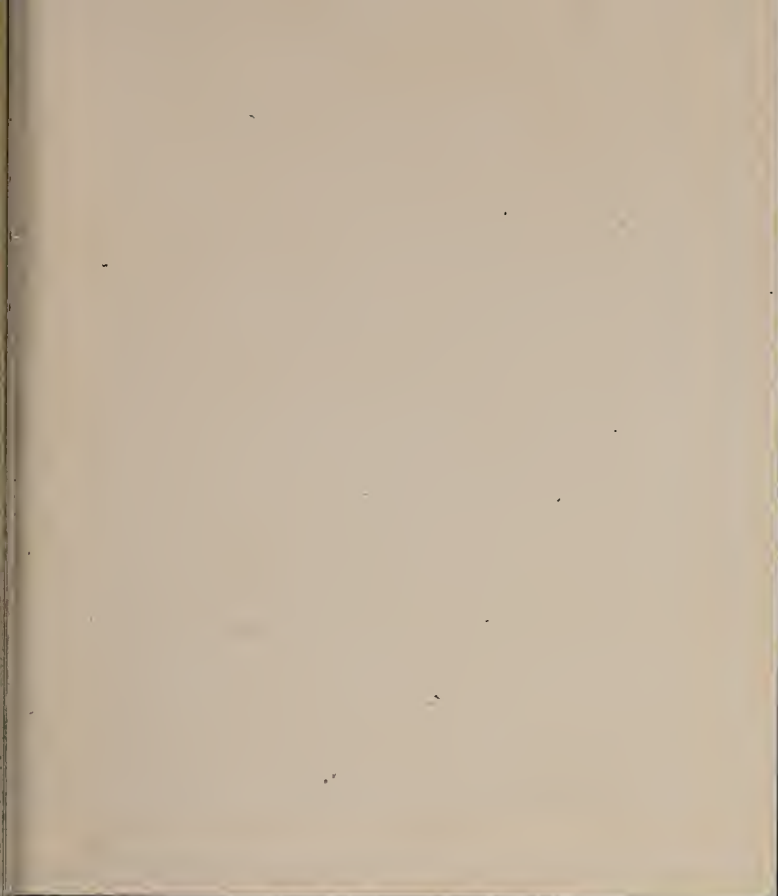


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# INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

## Worth Noting

“IBM has demonstrated a willingness to lose revenue in the short run in order to win back customers, sell its new products and improve service profitability in the long run.”

**Rebecca Segal**  
Director of the Customer Support Program  
International Data Corp.  
Framingham, Mass.

## People & Positions

**Mark DiCicilia** was named private branch exchange assistant product manager for the Telecommunications Systems Division of **Toshiba America, Inc.** of Irvine, Calif.

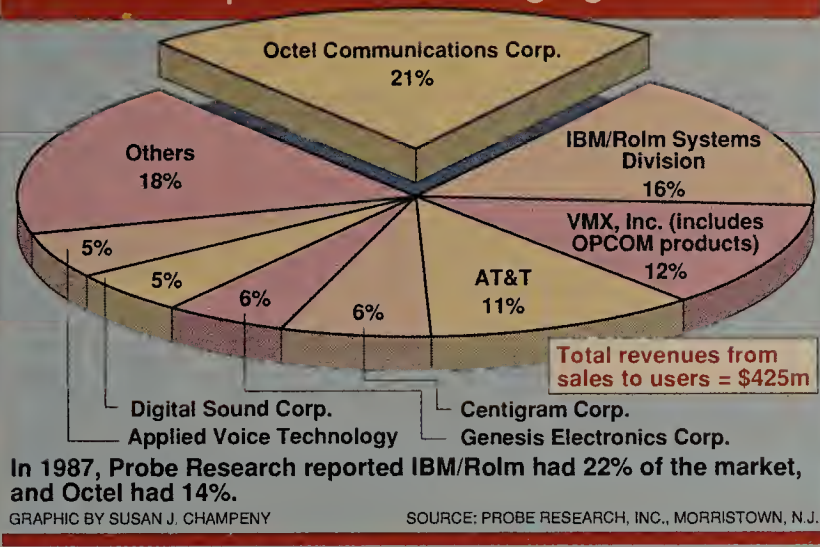
In his new position, DiCicilia will be responsible for product development and enhancements, product introduction and support, and collateral and technical documentation. Previously, DiCicilia was senior technical instructor for the division.

**Greg Shortell** was named vice-president of worldwide sales at **Emulex Corp.**, a Costa Mesa, Calif.-based data storage equipment maker. Shortell assumes responsibility for all domestic and international sales activities, including related support and administrative functions. Previously, Shortell served as the company's vice-president for international sales.

**Michael Gilbert** recently was named vice-president of engineering at **Echelon**, a Los Gatos, Calif.-based maker of local operating nets. These nets are used to control a variety of devices, including building security systems and factory automation equipment.

Gilbert will be responsible for directing the company's engineering activities in the development of its offerings. □

## Octel tops voice messaging market



## RBHC bid to fund outside development draws fire

AT&T, industry groups attack Ameritech plan.

By Gail Runnoe  
Washington D.C. Correspondent

WASHINGTON, D.C. — Allowing the regional Bell holding companies to fund outside manufacturers in return for royalties on new products will do little to benefit consumers, opponents of that plan told U.S. District Court Judge Harold Greene recently.

AT&T, Tandy Corp. and three leading communications trade groups filed briefs opposing a waiver request by Ameritech, which sought permission to fund development efforts of manufacturers in return for royalties from the sales of products. In January, the Department of Justice endorsed Ameritech's request and urged Judge Greene to sanction the plan ("Vendors take sides over RBHC-funded R&D projects," *NW*, Jan. 23).

Ameritech said such funding arrangements would make it easier for small, start-up companies with innovative technologies to develop new products and would encourage established manufacturers to expand their development programs to provide greater product variety.

But opponents of the plan say RBHC investment would stifle competition among manufacturers and would give the RBHCs strong incentives to abuse their monopoly power.

In its filing with the court, the North American Telecommunications Association (NATA) said "the [royalty] arrangement is akin to a limited partnership interest in a joint venture with a manufacturer." Such revenue-sharing interests in a manufacturing enterprise, NATA said, are clearly prohibited by the Consent Decree. NATA is a nationwide trade association that represents manufacturers, vendors, suppliers and users of voice and data communications equipment.

The Telecommunications Industry Association (TIA) concurred with NATA, saying that manufacturers without RBHC funding would be at a competitive disadvantage compared to the RBHC-backed firms. The arrangement, the TIA said, "could well drive [non-RBHC backed] manufacturers from the markets for the funded products."

Tandy argued that the Ameritech proposal would give the RBHCs the opportunity and incentive to exercise influence over the design of new products. Exertion of such influence over manufacturing activities, Tandy said, is also prohibited by the Consent Decree.

AT&T said in its filing that such manufacturer funding "would permit an RBHC to use a relationship with a manufacturer to evade rate regulation and transfer monopoly profits to unregulated activities." These were the same allegations brought against AT&T, the company said, in suits leading up to divestiture.

The Independent Data Communications Manufacturers Association, Inc. (IDCMA) also found fault with the plan. It said companies that control the local exchange can easily impede competition among manufacturers by favoring products produced by firms in which the RBHCs have financial interests. IDCMA said it fears that the RBHCs might disclose only to funded developers certain network information necessary to develop equipment. This would make it virtually impossible for other manufacturers to develop competing products.

IDCMA claimed that if RBHC funding is required to ensure the development of new equipment, an RBHC should be allowed to recoup its investment in the form of discounts on purchases, rather than royalties. □

## Naming products calls for creativity

Companies devote considerable time and energy to selecting the names with the right stuff.

By Gail Runnoe  
Washington D.C. Correspondent

Network products often represent the fruit of years of costly research and development efforts involving some of the most highly skilled scientific and technical personnel in the industry.

But once these products are ready for market, companies sometimes employ rather unscientific and unusual methods of naming them.

When product managers at Dayton, Ohio-based 10NET Communications, previously Fox Research, Inc., were ready to introduce the 10NET local network, they sought a name that would convey a certain visual image.

According to President Greg Goodall, "Our first thought was to have an image of the name 'ten-net' reflecting back and forth between two mirrors, showing 'net' spelled backward as 'ten.'"

But after learning that another company had already claimed rights to the name "ten-net," the company was forced to rethink its

strategy. At about that time, Goodall explained, the film *10* starring Bo Derek was receiving enormous attention in the media.

"After that film," Goodall said, "people began to associate the number 10 with something that's great or the best of its kind."

The company decided then to use the numeral 10 in its product name to evoke the same kind of positive image for its product that people were associating with the film.

Product managers at Conetic Systems, Inc. also had a clear image in mind when they named their Higgins integrated office system for local networks in 1984.

Howard Case, vice-president of marketing at the Higgins Group, now a subsidiary of Enable Software of Ballston Lake, N.Y., said that because the product was designed to help users in their daily lives, the company sought a name that would be readily identified with a butler.

(continued on page 12)

## INDUSTRY BRIEFS

**Novell, Inc.** recently reported net income of \$9.66 million for the first quarter ended Jan. 28, a 77% increase compared to \$5.45 million in net income reported in the first quarter of 1988. The Provo, Utah-based local network maker reported a 48% increase in revenue, which jumped to \$79.35 million this quarter from \$53.78 million for the first quarter of 1988.

Raymond Noorda, Novell's president and chief executive officer, said the results were in line with management's projections. "We are pleased with the strong demand for high-performance networking products the company experienced during the quarter — further evidence that our strategy to become primarily a software company is proving beneficial."

Novell has been moving away from sales of hardware and focusing more of its attention on software products. Shipments of software products represented 69% of its revenue during the first quarter of 1989, compared with 55% for the first quarter of 1988, he said. The company's software revenue was 80% higher during this year's first quarter than it was in the first quarter of 1988, a Novell spokeswoman said.

Frederick Ziegel, an analyst with Needham & Co., Inc., a New York-based brokerage firm, said Novell's results fell below his estimates. He had estimated that Novell would earn 42 cents per share for the first quarter but the company earned 35 cents per share instead.

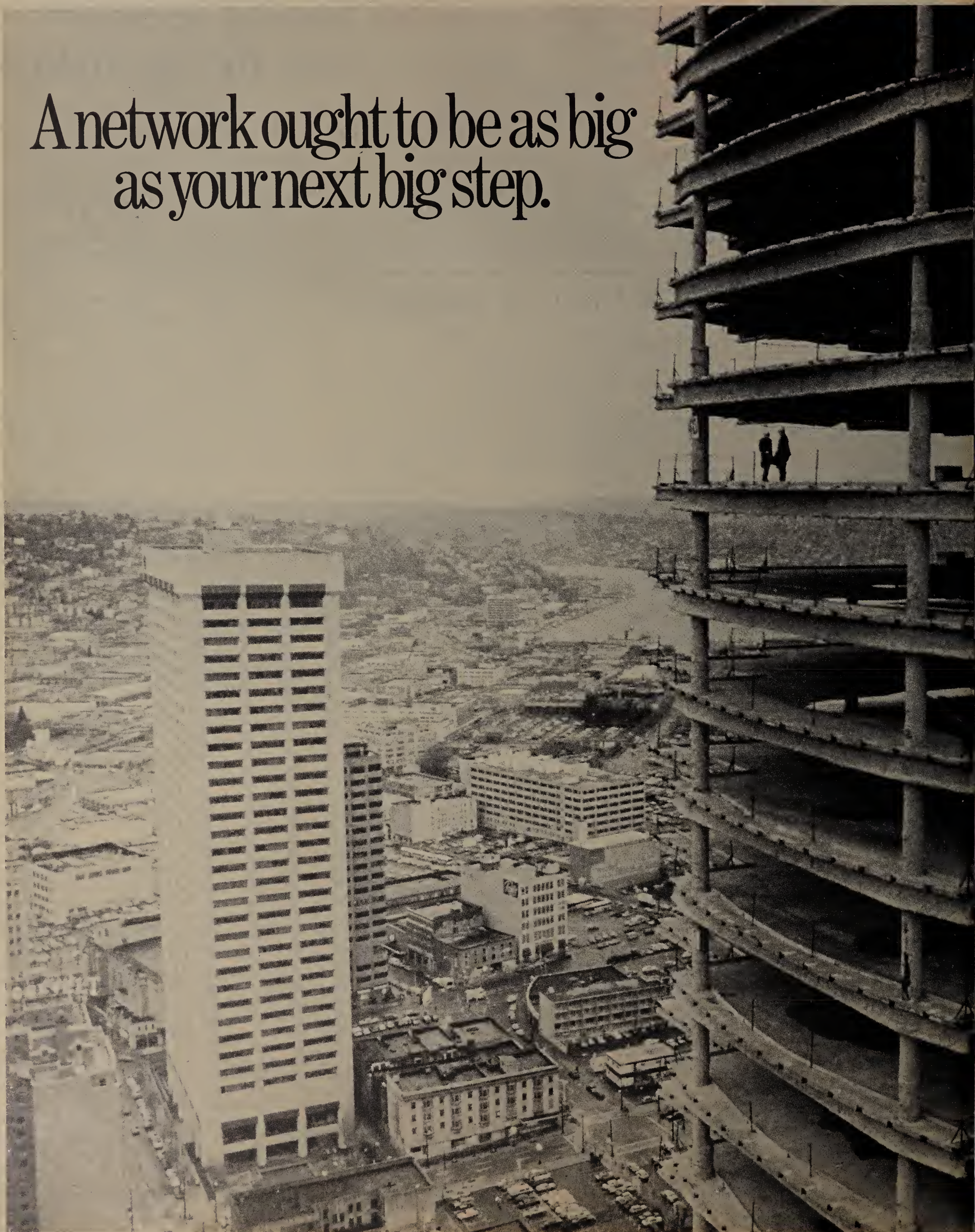
While Novell's numbers disappointed Ziegel, he said that the local net maker remains a market leader and continues to move forward. "As we look forward, Novell's opportunity and potential lies with the move of NetWare into other [environments]," Ziegel said. "They've got the DEC product, the [Apple Computer, Inc.] Macintosh product, they've announced Portable NetWare and NetWare for the Unix environment. The breadth of the product is what holds the opportunity." □



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## Naming products calls for creativity

continued from page 9

Conetic conducted what Case described as an ad hoc survey of about 100 people; most of those polled listed "Higgins" as the most likely name for a butler. Case attributed the correlation to the butler of the same name in the popular television series *Magnum, P.I.*

### Home, Higgins

Case said he believes that buyers often have a greater acceptance of a product with a person's name. "People then tend to personalize the product," he said. "When referring to the Higgins system, they'll say 'Give it to Higgins' or 'Higgins will take care of it.'"

Sometimes product names are chosen because they hold personal significance for the developer or someone at the manufacturing company. At Newbridge Networks, Inc., both the company name and the name of its MainStreet line of data network products hold special meaning for President Terry Mathews.

According to a spokeswoman for the Herndon, Va., firm, Newbridge was the name of the town in Wales in which Mathews grew up, and Main Street was the street on which he lived.

She said Mathews also liked the MainStreet name because it represents "where all the action happens" in a town. The name could also symbolize an important communications channel in a company's network.

Octel Communications Corp. and AT&T

decided to work with their employees to come up with names for new products.

According to a company spokesman, Octel first considered using a professional firm specializing in name selection (see "Image firms help pick the right name," this page) to label what would eventually be the company's Aspen line of voice-processing products.

After learning that the name selection process would take six to 12 months and cost Octel \$40,000, Robert Cohn, president and chief executive officer of the company, decided to conduct an in-house contest, offering a \$1,000 prize to the employee with the best idea.

An employee's son working as a shipping clerk for the summer suggested the name "Aspen," an acronym for automated speech exchange network. Though the

company had at one time used the image of mountains along with the product name, literature now has been redesigned to emphasize the Aspen acronym and not the connection to the Colorado city.

When AT&T searched for a name for its "Definity" private branch exchange introduced earlier this year, the company first compiled a list of suggestions from employees, according to a spokeswoman. The best ideas were then tested on business customers and analysts.

AT&T was looking for a word, she said, that would convey certain qualities of the product, particularly its expandability.

The name "Definity," a combination of the words "definite" and "infinity," fit the bill, she said, and has been trademarked by the company for national and international use. □

## Image firms help pick the right name

Upon the divestiture of AT&T, Lippincott & Margulies, Inc., an identity consultant, was recruited to help one of the newly formed regional Bell holding companies choose names for itself and its services.

With the firm's help, Nynex Corp. was born.

Clive Chajet, chairman and chief executive officer of Lippincott & Margulies, said the name Nynex was chosen to distinguish the RBHC overseeing New York Telephone Co. and New England Telephone and Telegraph Co. from other RBHCs and the smaller phone companies spawned by divestiture.

As described by Chajet, Nynex is a "made-up word" that is a combination of the "Ny" from New York Telephone, the "ne" from New England Telephone and an "x" to make the word unique and easy to pronounce.

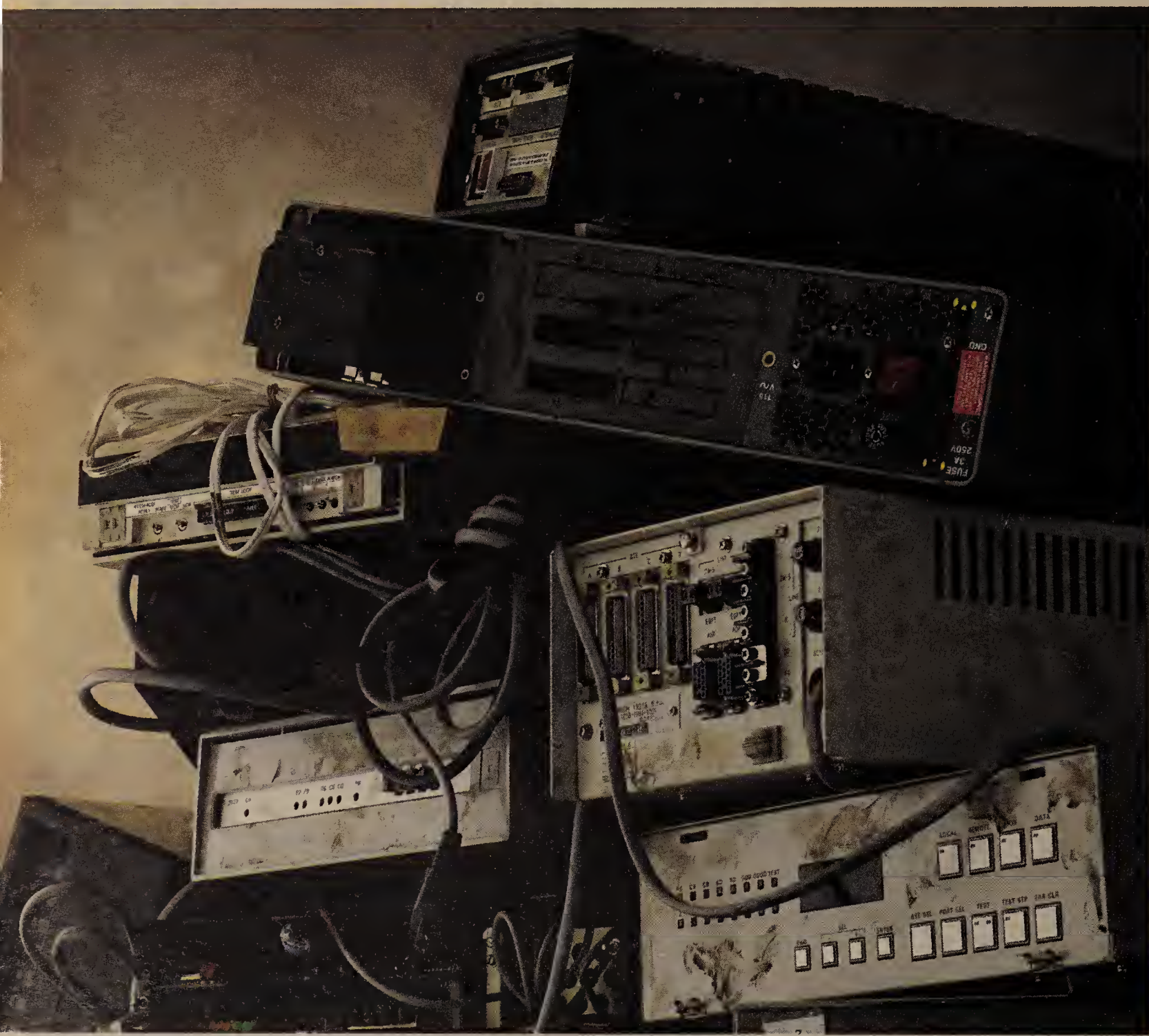
"A name is no less or more important in [the communications equipment and services] field than in any other field," Chajet said. "It has to be as distinctive, memorable and informative as possible."

A vendor working with an identity consultant should expect the naming process to last up to five months, Chajet said. The consulting firm has to become familiar with the vendor's new offering, how it fits in with the vendor's other products and what the competition is selling, he said. Then the image firm churns out a list of hundreds of possible names and works with the vendor to pick the best one, Chajet said.

A major challenge to image consulting firms with high-tech clients is understanding what a new product or service does. This often requires cutting through the industry jargon, he said.

Another difficulty is that features are very similar from one product to another and many of the best names have already been taken, he said. "You would think that in high tech, this would be less common because the field is relatively new. But because the field is so crowded with new products, it is as severe in high tech as in other fields."

— Bob Brown



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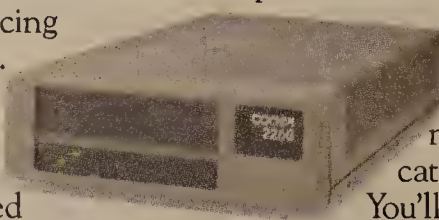
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# TELECOMMUNICATIONS

CARRIER SERVICES, CENTREX, CPE, WIRING SYSTEMS AND BYPASS

## Worth Noting

**A**ccording to AT&T's annual report, AT&T Bell Laboratories in 1988 pioneered the world's highest capacity commercial light wave system — a 3.4G bit/sec system capable of squeezing 50,000 simultaneous phone calls into a single pair of fibers.

## Carrier Watch

**ITT Communications Services, Inc.**, the long-haul unit of ITT Corp., last week announced that it will provide 10 free management reports for users of its dedicated services and a limited-time discount for users that place private-line orders by March 31.

ITT Management Reports detail monthly long-distance traffic and help companies determine how calling services are being used.

The reports assist users in identifying telephone service abuse, as well as in analyzing and optimizing service use.

The reports summarize overall usage by time of day, area code, day of the week, call duration, circuit and project billing code, according to an ITT spokeswoman.

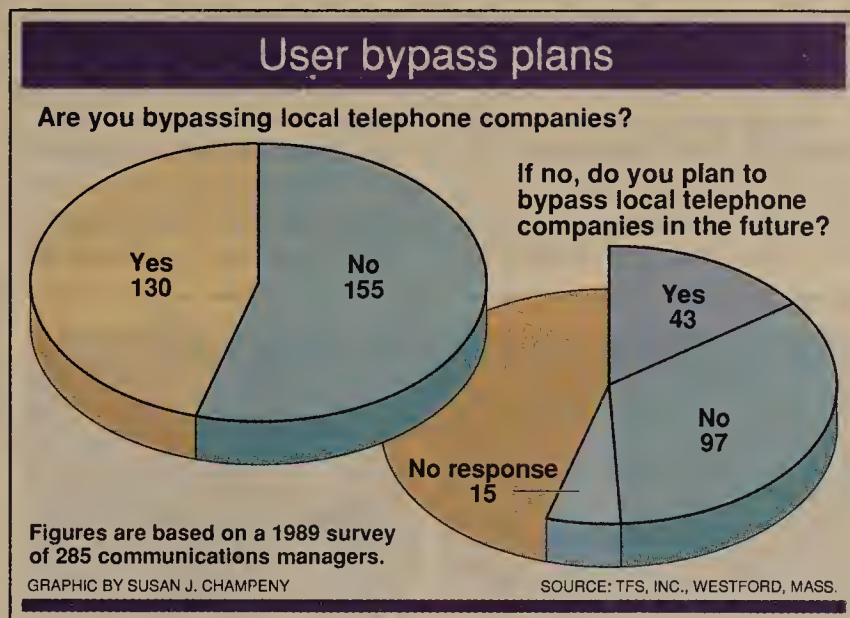
Other reports contain data on frequently called telephone numbers and long-duration calls.

Under the carrier's discount promotion, current and prospective customers that order new private-line services by the end of the month will receive a 25% discount off the cost of each circuit for one year.

The promotion covers the carrier's digital data services, which are available in 23 cities at 2.400, 4.8K, 9.6K and 56K bit/sec.

ITT sells T-1 service in more than 50 cities and voice-grade private-line services in over 75 cities.

**MCI Communications**  
(continued on page 14)



## West Germany touts ISDN services at CeBIT '89 show

Becomes second in Europe to offer technology.

By Amiel Kornel  
IDG News Service

HANNOVER, West Germany — West Germany recently became the second European country to support Integrated Services Digital Network, as the state-run Deutsche Bundespost telecommunications authority launched its commercial ISDN services at CeBIT '89 here.

Indicating the strong political backing enjoyed by the ISDN project, West German Chancellor Helmut Kohl and Bundespost Minister Christian Schwarz-Schilling were on hand as the Deut-

nected beginning in 1992.

The newly launched West German service has a capacity of 1,000 subscribers per city. Plans call for expansion to 61 cities next year, according to Bundespost official Rainer Lippert. This means the network could link almost 70,000 subscribers by 1991.

West Germany began upgrading its public telephone network from analog to digital in 1983 with the installation of the first digital exchange.

According to Lippert, 200 out of the country's 7,000 exchanges are now digital. By 1993, that number is expected to grow to 700. The upgrade is expected to take 30 years to complete, he said. So far, Siemens and Standard Elektrik Lorenz, an affiliate of French-controlled Alcatel N.V., have handled the switch upgrades.

The official launch of ISDN services here followed pilot ISDN projects in Mannheim and Stuttgart.

Following standard CCITT specifications, the Basic Rate Interface service supports two 64K bit/sec circuits and one 16K bit/sec signaling channel.

At its CeBIT exhibit, the Bundespost demonstrated transmission of voice, Group III and IV facsimile, video, videotex, teletext, packet-switched data and high-resolution still images over ISDN links.

Subscribing to the service, which is marketed exclusively by the Bundespost, initially costs roughly \$40 per month, along with a onetime \$70 installation charge. This compares with a \$14 monthly subscriber rate for a conventional telephone line.

CeBIT, the world's largest computer and communications trade exhibition, closed on March 15. **Z**

sche Bundespost announced availability of ISDN service in the country's eight largest cities: Berlin, Dusseldorf, Frankfurt, Hamburg, Hannover, Munich, Nuremberg and Stuttgart.

By 1993, officials said, ISDN service will be available throughout the country.

France, which has already launched ISDN services, will link its ISDN services with West Germany's next year, according to Hans Baur, head of Siemens AG's telecommunications activities. Connections to the UK and Italy are expected to follow soon after. The European Community ISDN plans call for services of its 12 member nations to be intercon-

## IBM plans support of used Rolm PBXs

Big Blue hurls headlong into used equipment mart with plan to certify, install, maintain used wares.

By Bob Wallace  
Senior Editor

WHITE PLAINS, N.Y. — IBM has thrown full support behind the used switch market with the creation of a single, nationwide plan to certify, install and maintain used Rolm private branch exchanges and station equipment, *Network World* has learned.

The company has simplified the lengthy process of qualifying used switches for IBM maintenance plans, slashed hefty PBX certification charges and eliminated 30- to 90-day waiting periods for service.

IBM outlined the support plan at a recent meeting of the National Association of Telecommunications Dealers (NATD) — a trade group representing 90 of the largest used equipment dealers in the U.S.

Solid IBM support for used Rolm PBXs will attract previously reluctant buyers to the market for used Rolm switches and boost their residual value, industry analysts said.

"Users will feel a great deal more comfortable about buying used Rolm PBXs knowing that IBM fully supports them," said Jon Rogers, a leasing analyst with IDC Financial Services Corp., a Framingham, Mass.-based consulting firm that tracks the mar-

ket for used telecommunications and computer equipment.

Users can save up to 70% by buying used equipment, according to Lise Stanford, vice-president of voice networking for First Tennessee Bank, N.A., a Memphis, Tenn.-based bank. "We've saved about \$600,000 over the last three years by buying used Rolm PBXs instead of new switches," she said.

In the past, however, the level of IBM support for used gear varied by region. "Regional officials were given a great deal of autonomy in choosing the level of used equipment support for their area," Rogers said. "As a result, dealers wouldn't set up shop in certain regions because they knew IBM support was weak."

Now dealers across the country will be quoted the same price for IBM certification of used Rolm switches. A secondhand switch cannot be brought under an IBM maintenance plan until it has been certified by IBM.

Certification involves taking an inventory of PBX components to ensure the switch is complete and fully operational.

Most dealers ask PBX vendors to certify switches before they buy them, according to NATD Vice-President William Pinker-

(continued on page 14)

## WASHINGTON UPDATE

BY ANITA TAFF

**MCI and IBM finish ISDN trial.** MCI Communications Corp. announced last week that it has concluded an Integrated Services Digital Network trial with IBM. The trial tested compatibility between ISDN and MCI's Vnet and Prism switched services.

During the tests, development laboratories of IBM's Rolm subsidiary, which are located in California and Florida, were connected through an MCI ISDN switch in Reston, Va. IBM equipment tested included a Rolm 9751 CBX.

According to Stuart Mencher, MCI's senior vice-president of corporate marketing, such trials will enable the company to support private branch exchanges from multiple vendors on its ISDN network.

Humberto Cordero, director of advanced systems operations in IBM Communication Systems, said the trial with MCI was part of an ongoing effort to ensure that Rolm equipment will be compatible with offerings from major carriers in the U.S.

In a separate announcement, MCI said it will begin using intelligent channel banks from Newbridge Networks, Inc., based in Herndon, Va., to terminate T-1 lines at customer premises.

**Westinghouse gets FCC OK.** Westinghouse Commu-  
(continued on page 14)



## IBM to support used Rolm PBXs

continued from page 13

ton. Dealers that modify switches also typically ask the vendor to recertify them before shipping them to users, Pinkerton said.

Besides establishing a uniform certification program, Rolm has addressed other problems that have plagued its used equipment efforts.

A source within IBM said the company sharply reduced the cost of certifying used equipment, but he declined to reveal the amount of the reduction. "We'll be charging a far more reasonable fee for certification than we were before," he said.

Interim waiting periods have also been eliminated, according to IBM.

In the past, IBM maintenance plans bought by users did not take

effect for 30 to 90 days. Repair calls made during the interim were often billed on an expensive per-visit basis.

In addition, IBM has agreed to modify used software to tailor switches to configurations specified by new owners.

In the past, some customers found to their surprise that the used Rolm switches they acquired were programmed to support more lines than they needed, but

IBM was unwilling to reprogram the switches. "If a user bought a used switch setup to support 200 lines, but only needed 100, they were on their own," said Steve Wexler, vice-president for Norstan Communications, Inc., a Minneapolis-based firm that sells both new and used Rolm PBXs.

Analysts said IBM support for used Rolm switches may eventually change the used PBX market. AT&T established a formal sec-

ondary market program for used AT&T switches several years ago, but other switch makers have been slow to follow suit. IBM/Rolm, with an installed base of 18,000 switches, is a significant presence, Rogers said.

"Up until now, the used equipment market has been a parts and service market. But it could be transformed into a systems market where customers buy whole switching systems," Rogers said.

Many dealers sell only a handful of PBXs a year, according to John Berlew, president of Frontier Computer Corp., a Dallas-based used switch dealer. "We may cut 600 parts and service deals before we sell an entire system," he said. But increased IBM support for used Rolm switches could change that ratio, Berlew said.

It's too soon to tell how IBM support for used switches may affect the market, Rogers said. According to IDC, users spent \$325 million last year on used switches and parts. That figure is expected to jump 14%, to \$375 million, for 1989. **■**

## Carrier Watch

continued from page 13

**Corp.** last week announced it will extend its international voice, data and facsimile services to ships at sea via the International Maritime Satellite Organization (INMARSAT) system. MCI said these offerings cost less than similar services available from AT&T.

The services are available to and from ships equipped with INMARSAT satellite equipment. U.S. subscribers can place direct-dial calls to ships located anywhere in the world, according to an MCI spokesman.

Ship-to-shore calls can be placed on a direct-dial basis to the U.S. and to all direct-dial countries served by the MCI international network. **■**

## Washington Update

continued from page 13

Communications Services, Inc. received approval from the Federal Communications Commission last week to lease satellite channels from Communications Satellite Corp. to sell business communications and television services. In its request, Westinghouse told the FCC it would use the satellite capacity to provide digital and analog voice, data and video services to government and corporate users.

The company said it would locate earth stations near end users, eliminating the need for satellite uplink facilities. Westinghouse claimed in its FCC filing that it would be able to provide services that are less expensive, technically superior and more secure than services currently available. **■**



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# DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

## Worth Noting

Last year, 40% of 280 large user sites responding to a survey had at least one person physically monitoring their network 19 to 24 hours per day, according to a study entitled "The Status of Network Management" by Westford, Mass.-based TFS, Inc. In 1986, just under 30% did so, the study said.

## ata Packets

**Metropolitan Life Insurance Co.** last week signed a \$3.8 million contract with **Contel ASC** for a satellite communications system that will back up its main data centers while supporting high-volume printing at four other locations.

The vendor will install, operate and maintain the satellite net linking Metropolitan Life's New York headquarters with regional data centers in Pennsylvania, South Carolina and Kansas. In addition, earth stations will link the South Carolina location with three other processing centers that print the company's health insurance claim checks.

If the company's terrestrial T-1 backbone is disrupted, Metropolitan Life's network staff will use Contel ASC's proprietary NCS 1000 Network Controllers to access the satellite channels and reestablish communications among all sites within a few minutes.

Metropolitan Life began studying backup options in the wake of the May 1988 Illinois Bell Telephone Co. central office fire. The company's Illinois processing center was without data service for a week and without phone service for two weeks. The satellite network is scheduled to be operating by July.

**NEC America, Inc.** recently announced improve-  
(continued on page 16)

## DEC's FTAM upgrade meets U.S., UK GOSIP standards

Firm also unveils software for MicroServer 2000.

By John Cox  
Senior Editor

LITTLETON, Mass. — Digital Equipment Corp. recently announced an enhanced version of its VAX File Transfer, Access and Management (FTAM) software that conforms to both the U.S. and UK's versions of the Government Open Systems Interconnection Profile (GOSIP).

FTAM Version 1.1 allows users of DEC VAXs running the VMS operating system to transfer, copy, delete and display files from other computers that support the FTAM specification defined by the International Standards Organization.

In August 1990, computer and communications products purchased by federal agencies will be required to support GOSIP standards.

The FTAM announcement was made in conjunction with the introduction of DEC X25Portal 2000, software for DEC's MicroServer 2000 that enables users to transport X.25 data over DECnet networks ("DEC to use DECnet as X.25 pipe," NW, Feb. 6).

MicroServer 2000, which was announced last August as a platform for gateway products, is an Ethernet server based on a 32-bit MicroVAX II processor.

X25Portal 2000 will make it possible to link X.25 data terminal and data communications equipment over existing DECnet facilities.

### WAN net controller

In addition, DEC unveiled Wide Area Network Controller 220, a two-line synchronous communications controller for VAX computers based on DEC's proprietary Bus Interconnect bus to X.25, IBM Systems Network Architecture and DECnet networks.

The board supports either two DECnet lines at speeds up to 64K bit/sec or a single line to X.25 or SNA networks at 192K bit/sec.

X25 Portal 2000 costs \$16,500 and is available now. Prices for FTAM Version 1.1, available now, range from \$900 to \$21,600. DEC Wide Area Network Controller 220, also available now, costs \$8,450. ■

## Timeplex unveils Link T-1 mux maintenance service

By Jim Brown  
New Products Editor

NEW YORK — Timeplex, Inc. last week announced an equipment monitoring and control service for users of its Link T-1 multiplexers.

The ComWatch maintenance service, announced at the Interface '89 Plus conference here, will enable Timeplex to manage customer nets around the clock. It is targeted at users that do not have a dedicated network management staff or only man their control centers part of the day.

To offer ComWatch, Timeplex will install Secure Access Modules (SAM) at user node sites and connect them to the supervisory ports of Link T-1 multiplexers. SAMs take the place of local management terminals and are capable of receiving alarms from the Link multiplexer and the T-1 net.

Alarms detail Link failures down to the component level, including problems with port boards, power supplies, cooling fans or network interfaces. Network link failures and performance problems such as excessive bit error rates or signal loss are also tracked.

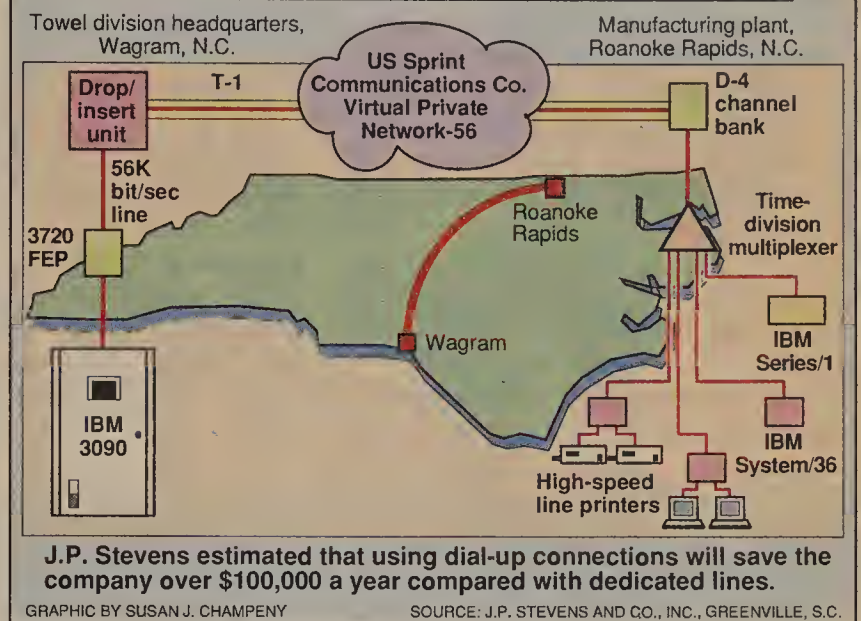
The SAM reports alarms to an Intel Corp. 80286-based microcomputer located at Timeplex's Technical Assistance Center in Clearwater, Fla., by establishing a dial-up link to the center. Technicians at the center use the microcomputer to issue commands to the SAM that are then relayed to the multiplexer.

"We can do everything through a ComWatch SAM attached to the supervisory port of a Link that a local field engineer or customer can do," said Jim Allen, director of service planning.

Allen said ComWatch contracts, which will span at least one year, will be negotiated on an individual basis. Customers, for example, will be able to define the types of corrective actions Timeplex technicians can take. They can also request that Timeplex monitor other vendors' equipment, such as private branch exchanges, in the net.

ComWatch differs from the company's facilities management service, which has been offered on a limited basis since last year. With that service, Timeplex assumes full responsibility for  
(continued on page 16)

## Low-cost switched 56 at J.P. Stevens



## Textile giant tests US Sprint's VPN-56

J.P. Stevens weaves switched 56 service into net to alleviate low-speed transmission bottleneck.

By John Cox  
Senior Editor

GREENVILLE, S.C. — Textile giant J.P. Stevens and Co., Inc. is testing US Sprint Communications Co.'s recently announced switched 56 service as a low-cost, high-speed transmission option to solve a network bottleneck problem.

J.P. Stevens, one of the first customers to try US Sprint's Virtual Private Network-56 (VPN-56) service, is using the service to link a manufacturing site in Roanoke Rapids, N.C., to a divisional headquarters located 300 miles south in Wagram, N.C.

US Sprint announced VPN-56 last month. It is expected to be generally available in June.

For J.P. Stevens, the service replaces three dedicated analog lines, supporting data at 9.6K and 14.4K bit/sec. The dedicated lines linked the plant's data center to an IBM 3090 mainframe at the Wagram divisional headquarters.

With the dedicated circuits, terminal response times on the factory's IBM System/36 and Series/1 minicomputers were less than desirable.

Terminals attached to these minicomputers also accessed applications on the headquarters mainframe. Further compounding matters, the low-speed lines were not fast enough to link the mainframe to the factory's two high-speed printers, which crank out vital production reports needed to run the factory each day.

The carrier's VPN-56 service also supports J.P. Stevens' goals of using virtual network services to merge data with voice traffic over digital lines wherever possi-

ble, migrating to high-quality fiber-optic connections and saving money by replacing dedicated lines with dial-up connections, according to John Edwards.

Until recently, Edwards was director of telecommunications at the company. His department was phased out when another firm, with its own telecommunications department, acquired the textile maker. Last week, Edwards started with Royal Insurance Co. as its network planning manager.

Jim Gathings, computer operations manager for the Wagram data center, said the switched 56 service is already paying dividends. Its main benefit so far is lower cost.

With the dedicated circuits, terminal response times were less than desirable.

▲▲▲

The Roanoke Rapids staff has seen a 20% increase in network throughput, but Gathings said that jump may be due to the fact that digital connections require far less retransmission of data than analog lines do.

If at first . . .

J.P. Stevens committed to VPN-56 only after it failed in an attempt to use very small aperture terminal satellite technology.

(continued on page 16)



## Textile giant tests US Sprint's VPN-56

continued from page 15

The multiple computers at the plant created too many acknowledgments to pass through the satellite link while trying to maintain the full data rate. A vendor-maintained shared hub, used by several customers, would have solved this problem by simulating the acknowledgments needed by the mainframe, thus maintaining the full data rate, Edwards said. But a shared hub was not available to the rural J.P. Stevens sites.

While AT&T's Dataphone Digital Service would also have been an option, AT&T did not offer the service in the company's area.

VPN-56 promised to solve the plant's problem because it offered the high speed

of a dedicated digital link at the low cost of a dial-up service. Both locations already had T-1 links to US Sprint for VPN voice traffic, so new T-1 links — a prerequisite for switched 56 service — were not necessary.

J.P. Stevens' VPN-56 connection turned out to be somewhat complicated because each location used a different brand of private branch exchange.

### Bypassing the PBXs

Due to some incompatibilities that existed between the company's different PBXs, Edwards said his staff worked out a scheme to bypass the PBXs by sending data between both locations through the exist-

ing T-1 links and over the VPN-56 service.

The company used existing T-1 links that were supporting voice traffic over an existing US Sprint virtual network. At the Roanoke Rapids manufacturing center, Edwards' team added a 56K bit/sec line card to a channel bank that connected the plant's minicomputers, through a time-division multiplexer, to the T-1 pipe. By doing so, the company was able to support a data path from the factory data center to the VPN-56 service.

At the Wagram headquarters, Edwards added a drop-and-insert device, a multiplexer used to drop out or insert channels in a communications circuit, between the US Sprint network and the Wagram PBX. This device extracted the 56K bit/sec data channel from the T-1 link and passed it on to a separate time-division multiplexer

and, from there, to the Wagram mainframe. The drop-and-insert device sent the voice traffic on to the PBX.

J.P. Stevens now dials into the VPN-56 connection each morning and stays online about 16 hours per day for as many as 28 days per month.

Edwards estimated the previous analog lines and their associated equipment cost about \$3,200 per month, providing a total bandwidth of 33.6K bit/sec. The VPN-56 connection averaged about \$1,900 per month and provided 56K bit/sec capacity. "I could run [the VPN-56 link] 24 hours a day and still save money," he said.

The manufacturing plant is now able to complete its print runs on schedule, the terminal operators see faster response times and the connection runs virtually error-free, he said. ■

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\*AT&T Megacom/SDN, US Sprint VPN and MCI V-NET are all trade or service marks of their respective companies.

## Timeplex unveils maintenance service

continued from page 15

the day-to-day operation of user nets. "It's really taking on total network maintenance and management responsibility. We're not talking about that with ComWatch," Allen said.

"With ComWatch, we will not begin restoral activity on devices unless the customer is covered under a maintenance contract with us," Allen said.

When monitoring other vendors' equipment under a ComWatch contract, Timeplex will alert customers when alarms from those devices have been received, or it will contact the manufacturer of that equipment.

Pricing for ComWatch, which is about to enter beta testing, depends on the contract developed with customers. ■

## Data Packets

continued from page 15

ments in its V.32 modem line and cut prices on its SPN series of diagnostic, leased-line modems.

The N9630 modem (formerly the DSP9630) has been repackaged to weigh 45% less and use 40% less power than the earlier 9.6K bit/sec V.32 modem. NEC America also added a nine-number telephone directory, backed up by nonvolatile memory and new front-panel menus, to simplify diagnostics, configuration and installation.

The N9630 now supports the Hayes Microcomputer Products, Inc. AT command set, making it compatible with a wider variety of software packages.

The SPN series uses a primary channel for data transmission and a side channel to support various network monitoring functions at the same time. New prices for the SPN modems range from \$3,090 to \$4,560, compared with the previous price range of \$4,035 to \$7,995.

Finally, NEC America announced pricing for its previously announced Network Control and Management System (NCMS)/PC 386. The company claims the NCMS/PC 386 is the first system that can monitor dial-up, digital and analog lines at the same time. Prices depend on configuration and range from \$16,000 for a base system to \$37,500 for the high-end system.

NEC America's Data and Video Communications Systems Division can be reached by writing to 110 Rio Robles, San Jose, Calif. 95134, or by calling (408) 433-1250 or (800) 222-4632, ext. 1277. ■



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# LOCAL NETWORKING

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## Worth Noting

“The IEEE 802.2 committee won’t stop. It’s growing arms and tentacles and generating standards faster than they can be brought to market. I’m getting tired of all these different groups. They are too expensive and are operating at cross-purposes.”

**Bob Metcalfe**  
Founder and vice-president  
3Com Corp.  
Santa Clara, Calif.

## Netnotes

**Racore Computer Products, Inc.** has repriced its line of token-ring adapters and now offers one eight-bit board for \$399.

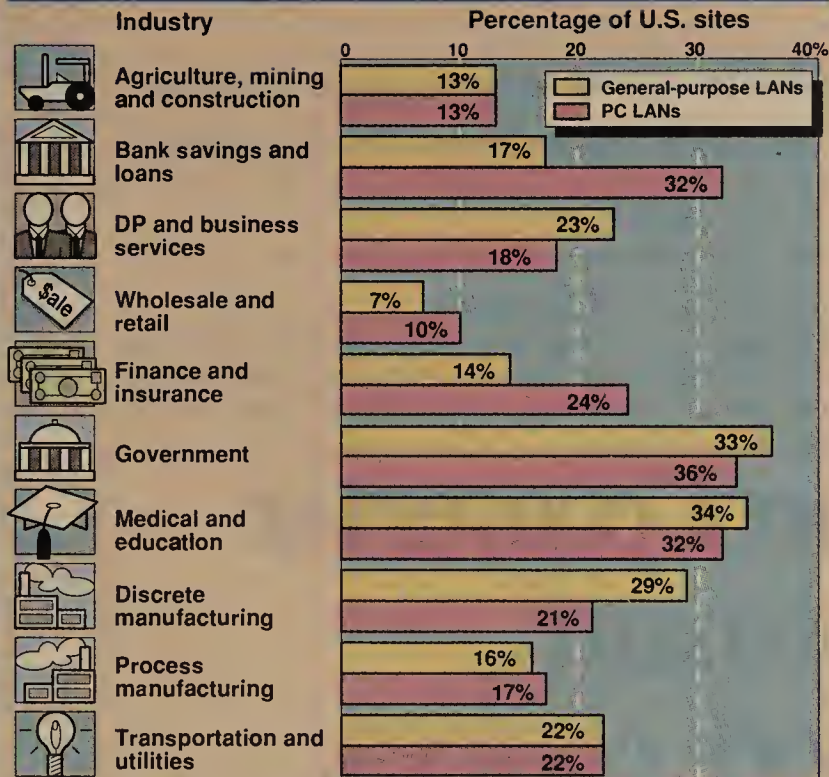
Racore has cut prices on three models of 4M bit/sec token-ring adapters. At the low end, the eight-bit version lists for \$399, while \$499 is the price for each of the two 16-bit boards — one for microcomputers using IBM’s traditional Personal Computer bus and one for Personal System/2 models with the newer Micro Channel bus architecture.

Officials of Racore, based in Los Gatos, Calif., predicted a downward trend in the cost of token-ring nets. Racore is betting that this will fuel demand for token-ring products.

At a briefing earlier this month, Racore President Paul Rasmussen said aggressive pricing should help Racore and other network adapter makers that follow suit to chip away at IBM’s huge share of the token-ring market. Analysts estimate IBM’s market share to be as high as 90%.

**SynOptics Communications, Inc.**, which offers the LattisNet Ethernet-over-twisted-pair products, is moving into the Open Systems Interconnection market via a product and technology agreement  
(continued on page 21)

## LAN usage by industry



A survey of 19,000 businesses indicates that government agencies, medical and educational organizations, and banks are the heaviest users of local networks.  
GRAPHIC BY SUSAN J. CHAMPENY SOURCE: COMPUTER INTELLIGENCE, LA JOLLA, CALIF.

## Users hesitant to embrace nascent OS/2 LAN Manager

Firms take wait-and-see attitude about net O/S.

By Laura DiDio  
Senior Editor

Early reports indicate users will not be quick to abandon their current local network operating systems for the Microsoft Corp./3Com Corp. OS/2 LAN Manager.

A lack of applications designed to work with the fledgling OS/2 LAN Manager, combined with satisfaction with their current network operating systems, were the major reasons users gave for their reluctance to migrate to OS/2 LAN Manager.

In addition, users said they still have questions about the performance and capabilities of OS/2 LAN Manager. Until their concerns are cleared up, users are not sure what, if any, benefits they would realize by adopting the new net operating system.

“Switching network operating systems is a big move that entails retraining personnel and investing money in new software,” said Richard Thomas, manager of end-user support at Welch Allyn Corp., a Skaneateles, N.Y.-based manufacturer of medical diagnostic equipment. “Right now, there’s nothing to indicate that OS/2 [LAN Manager] would serve us better than NetWare.”

Welch Allyn runs Novell, Inc.’s NetWare on several IBM Token-Ring Networks, each of which supports 50 to 60 nodes.

The most important issue facing Welch Allyn, according to Thomas, is establishing connectivity with IBM’s Application System/400 (AS/400) mid-range

system. “I don’t see [OS/2 LAN Manager] in our environment until at least 1991. [With its] recent announcements of support for Unix systems and the AS/400 via Portable NetWare, Novell has our connectivity needs covered,” he said.

Also, Thomas said, “if Portable NetWare evolves the way we think it will, it’s going to be very difficult for OS/2-based nets to supplant NetWare.”

Although reluctance to switch to the OS/2 LAN Manager is to be expected from NetWare users, even longtime 3Com users are balking at OS/2 LAN Manager.

“There just aren’t enough gains to justify the cost of switching from our DOS-based 3+ operating system to 3+ Open,” said Stephen Larson, systems analyst at Smith-Corona Corp., a manufacturer of typewriters and word processors in Cortland, N.Y.

“We’d have to switch the servers, the PCs, add memory and retrain our personnel,” he said. Smith-Corona’s local nets support Unix- and DOS-based processors and use software packages that wouldn’t run under OS/2. “Besides the fact that our current engineering software packages are incompatible with [OS/2 LAN Manager], we wouldn’t be able to buy any comparable OS/2 engineering software since it doesn’t exist yet,” Larson said.

“The bottom line for myself and a lot of other users is, we’re not going to consider installing  
(continued on page 21)

## Users move toward integrated net mgmt.

Major LAN vendors respond to growing demand among users for corporatewide network control.

By Susan Breidenbach  
West Coast Bureau Chief

SAN FRANCISCO — Whether by choice or by dictum, network managers in the near future will be faced with the task of integrating their local networks into corporatewide net control systems.

As corporate networks embrace distributed computing and client/server architectures, network managers are faced with tracking events across several different networks. To accomplish this feat, they need to merge different net control systems into a centralized system capable of policing network security, monitoring events across the installation and reacting to alarms with the proper remedial commands.

“What network management is all about now is keeping these mixed information systems up and running,” said Craig Burton, senior vice-president in charge of strategic directions for Novell, Inc. “When you start getting into multivendor, multiprotocol environments, network management becomes extremely important.”

That is the way Sytek, Inc. and Hughes Aircraft Co.’s Hughes Network Systems, Inc. subsidiary

see it too. The two companies, which have announced plans to merge their respective local- and wide-area network businesses, have made the development of an enterprisewide net management system their top priority.

Similarly, 3Com Corp. is “heading very strongly in this direction,” said Eric Benhamou, vice-president and general manager of 3Com’s Software Products Division.

Users have been screaming for integrated network management for years, according to Steve Spanier, a vice-president at Infonetics, Inc., a market research firm in Santa Clara, Calif.

### Survey says . . .

In a just-completed survey of Fortune 500 companies, Infonetics determined that the three most important net management features now, and for the next two years, are security, fault isolation and performance monitoring.

“Users always want more security,” Burton said. Local network security has a tough time comparing favorably to what us  
(continued on page 51)

## LANMARKS

BY MARLY CARDOZO

## OSI vs. TCP/IP: mudslinging isn’t answer

Networking vendors too often treat the choice between OSI and TCP/IP as a black-and-white, either/or proposition, resulting in mudslinging that is as bad for the customer as it is for the industry.

On one side are the advocates of Transmission Control Protocol/Internet Protocol, who say the standard has a more impressive track record and installed base than Open Systems Interconnection standards and that OSI will take another 10 years to become viable.

They also point to services that haven’t been delivered with OSI yet, but are available today with TCP/IP.

Consider distributed filing. Sun Microsystems, Inc.’s Network File System (NFS), a transparent, distributed filing facility that runs over TCP/IP, allows users to access data files and applications on remote systems without having to learn new commands.

This capability would seem to be a fundamental part of any network, but so far there is no NFS equivalent in OSI.

The same is true for directory services. Although modest in scope compared to the extensive directory services proposed  
(continued on page 20)

Cardozo is product manager of international communication standards and mail connectivity at Sun Microsystems, Inc. in Mountain View, Calif.



## Mudslinging isn't the answer

continued from page 19

under OSI, TCP/IP's naming service, The Domain Name System, has the singular virtue of being available today.

On the other side are supporters of OSI. They characterize TCP/IP as two cans connected by string. OSI protocols, they say, are far more robust in addressing networking needs.

At the application level, for example, OSI's X.400 electronic mail protocol is capable of interchanging spreadsheets, PostScript images, data bases and other formats in addition to simple text. OSI advocates also talk about global directory services, on-line transaction processing and other business services that simply

weren't part of the Department of Defense's conception of TCP/IP.

As for the relatively small OSI installed base, supporters say it is growing. OSI has the added advantage of being an interna-

falls in a gray area between.

Networking is a world of evolution, not revolution. Just as it took decades for TCP/IP to become accepted as the de facto standard, it will take quite a while before

**J**ust as it took decades for TCP/IP to be accepted as the de facto standard, it will take quite a while before OSI supplants it.

▲▲▲

tional standard, with testing organizations coming on-line to assure conformance.

Which is better? As is often the case with issues that appear black or white, the truth

OSI supplants it.

Some users won't abandon TCP/IP any more than they'd abandon COBOL or FORTRAN. The investment is too great, and be-

sides, the technology does what they need it to do.

A better strategy, one that is too often overlooked, may be to adopt both. There are at least three ways to go about this:

- Dual-stack configurations, in which both networking protocols coexist in some or all systems but never interoperate.
- Gateways, which provide interoperation between systems using different protocols.
- Hybrid stacks, in which the top layers are OSI and the lower layers are TCP/IP, or vice versa.

In a dual-stack configuration, systems support both TCP/IP and OSI protocols in parallel over a single physical network — both running under a Unix, VMS or other multitasking, multiprocessing operating system.

### Peaceful coexistence

Dual-stack arrangements allow the introduction of OSI protocols into a TCP/IP environment without additional investment in computer systems.

Users of dual-stack systems can gain OSI experience without disrupting TCP/IP connectivity. In this scenario, the two environments coexist peacefully, enabling users of both persuasions to get their work done.

Of course, the twain shall never meet. Because both network environments are independent, users typically need two parallel sets of applications and must know which one to invoke based on network configuration.

By adding a gateway to a dual-stack system, much of the underlying complexity can be hidden from users. Gateways enable TCP/IP and OSI systems to interoperate by converting between corresponding TCP/IP and OSI functions.

For example, with an E-mail gateway on the network, users of TCP/IP E-mail programs can transparently exchange messages with users of OSI E-mail (X.400) programs.

Both sets of users can extend their reach to a broader E-mail community without affecting their current routines. Compared to dual-stack solutions, relatively few gateways are needed to service an internetwork, so their impact on the total software investment is minimized.

### Borrowed applications

With a hybrid stack, a TCP/IP installation could borrow an application from OSI. For example, X.400 might be hooked into a TCP/IP network, thus providing the benefits of an advanced E-mail application without having to convert the entire network backbone.

Of course, users could only communicate with those who had the same arrangement.

It is true, of course, that these three approaches are compromises. As the number of dual-stack systems increases, for example, functions such as network configuration, administration and maintenance become complex.

In the case of gateways, functionality is lost in the translation.

Performance is also degraded, making gateways a weak solution where fast response time is important. On the other hand, gateways make perfect sense for store-and-forward E-mail systems and other batch-like applications.

Perhaps the best reason to implement TCP/IP and OSI simultaneously is that it lets TCP/IP users experiment with OSI functionality while still doing business on a proven network. ■

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## Users hesitant to embrace

continued from page 19

the OS/2 LAN Manager until the application support is there. And no one knows for sure when that will be," he said.

Other industry participants expressed similar sentiments about OS/2 LAN Manager.

"I hear people talking about the future capabilities of OS/2 LAN Manager, but I don't know if vendors are actually delivering on their promises yet," said Dick Murphy, president of Carolina Business Systems, a systems integrator in Charleston, S.C.

Most users, Murphy said, are taking a wait-and-see attitude regarding OS/2 LAN Manager. As long as there's doubt about OS/2 LAN Manager's performance, users will make do with existing network operating systems such as NetWare or 3Com's older MS-DOS-based 3+.

"These are known quantities. Users know what they've got and what the operating systems can do," he said. Murphy said his customers are pleased that Novell has committed to supporting most major operating systems, including Unix, DOS, OS/2 and, most recently, the AS/400's OS/400 operating system.

"Our users are telling us they'll stick with NetWare because no matter which network operating system they add to their environments, they're confident Novell will support it," he said.

One such user is Cleveland

State University in Cleveland. The university has a mix of Ethernets supporting NetWare and Digital Equipment Corp.'s DECnet, said David Chatfield, staff member of academic services in the Computer Services Department.

"DOS and NetWare aren't going to disappear anytime soon. We'll add to those networks rather

than switch to OS/2 LAN Manager," Chatfield said.

However, Cleveland State will soon install an IBM OS/2 Extended Edition-based network in its computer center for experimental purposes. The school may eventually expand its use of OS/2 Extended Edition to other parts of the campus.

But Chatfield said he doesn't foresee a major role for the OS/2 LAN Manager. "[OS/2] LAN Man-

ager won't serve a significant portion of our user population in the near future. We just don't see how it can be beneficial to us. The network operating systems we have in place suit us just fine."

Stuart Carol, network project leader at Mutual of America Insurance Co. in New York, expressed a similar view. He said the expense of having to purchase additional random-access memory is one reason his compa-

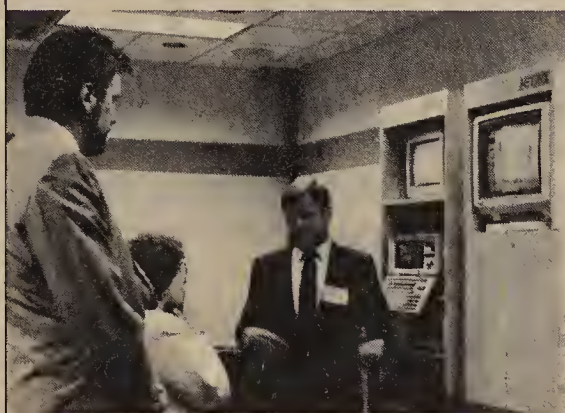
ny is sticking with Novell System Fault Tolerant (SFT) NetWare instead of migrating to OS/2 LAN Manager.

"It takes a minimum of 3M to 4M bytes of resident RAM memory on each workstation to run the few existing applications for OS/2 LAN Manager," Carol said. "NetWare SFT running on our 4M bit/sec IBM Token-Ring Nets is serving our needs more than adequately." ■

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## Netnotes

continued from page 19

with Retix, a leading provider of OSI products.

SynOptics, based in Mountain View, Calif., said the partnership will result in a data exchange capability between LattisNet net management technology and OSI-based net management systems.

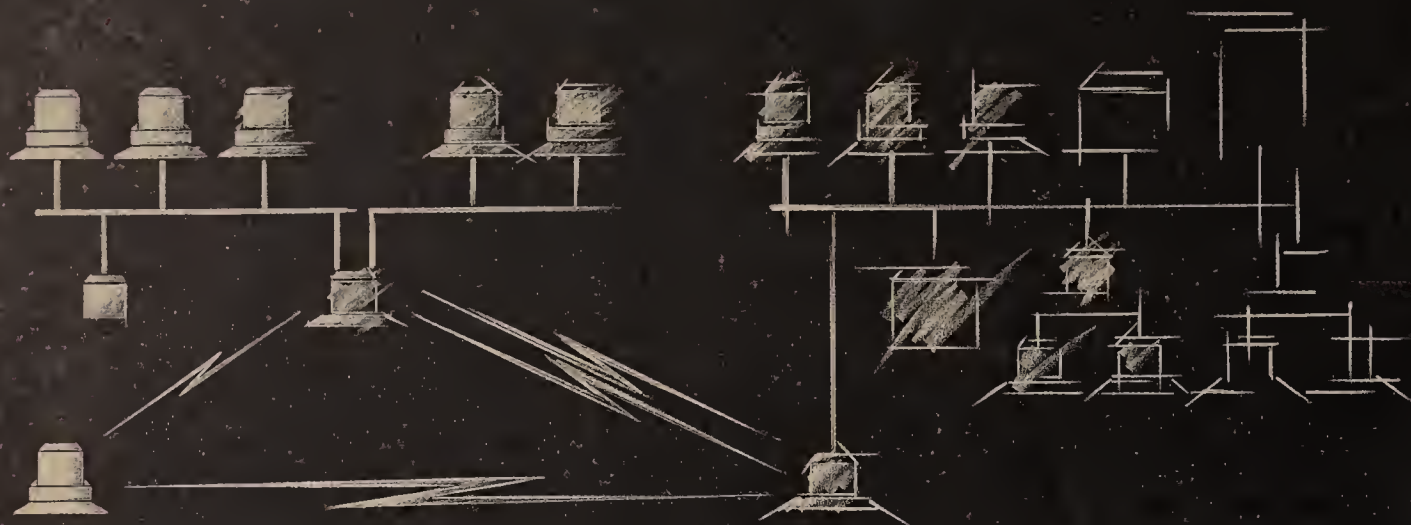
The LattisNet network management product, released last December, operates in conjunction with LattisNet concentrators to provide centralized network control and monitoring of a LattisNet local network's physical and data-link layers.

Excelan, Inc.'s **Kinetics, Inc.** division, a manufacturer of Ethernet adapters for Apple Computer, Inc. Macintoshes, is developing an Ethernet card for NeXT, Inc.'s new computer.

The Kinetics NL, which is scheduled for release in the third quarter of 1989, will provide the NeXT computer with standard and twisted-pair Ethernet connections.

Kinetics, based in Walnut Creek, Calif., said the board is being developed in conjunction with SynOptics Communications, Inc. and will incorporate SynOptics' LattisNet technology. Pricing has not been set yet. ■





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# MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

## Worth Noting

**C**ommunicating effectively was the most important concern of 120 Fortune 500 information systems executives surveyed recently by Chicago-based Arthur Andersen & Co. Ninety-two percent of the respondents rated this either extremely or very important, more than any other technical or managerial issue addressed in the survey.

## Dialogue

**Is it time to lift the restrictions barring the regional Bell holding companies from manufacturing net equipment?**

“It’s really a delicate situation, but I tend to agree with the vendors. It probably is time [to lift the restrictions].”

“This [U.S. District Court Judge Harold] Greene situation is one that I think everyone questions. He did a fine job in 1984. Now there should be some other vehicle for controlling the telecommunications industry. Greene should be taken out of the picture at this point.”

“I don’t see how [letting the RBHCs manufacture equipment] can hurt. It certainly wouldn’t hurt our balance of trade.”

**Douglas Ballou**  
Independent consultant  
Lancaster, Ohio

“I think it’s natural that they get back into the business. If it’s profitable for them and they can do a good job, let them do it. If they’re going to fail at it, they’ll back out.”

“However, I think the [public] network still needs to be controlled. They can manufacture and sell, as long as they do so through separate entities. I’d hate to see any one business entity subsidize the other.”

**Stephen Carnilla**  
Director of telecommunications  
University of Chicago

## MAP/TOP Users Group considers MAP upgrade

Modified standard could be available next year.

By Barton Crockett  
Senior Editor

ANN ARBOR, Mich. — The North American MAP/TOP Users Group is considering releasing a new version of the Manufacturing Automation Protocol standard as early as the end of next year.

The modified standard would allow the use of fiber-optic cabling in MAP factory networks and would support a common application interface for the Manufacturing Messaging Specification (MMS), which allows general-purpose computers to issue commands to more specialized processors on the factory floor. The application interface specifies a common way for a vendor’s proprietary application software to work with MMS.

Release of a new version of the MAP specifications, which is currently being contemplated by influential members of the MAP/TOP Users Group here, does not represent a retreat from the group’s earlier statement that it would wait six years before changing MAP Version 3.0, which was unveiled in June 1987, said Michael Kaminski, manager of advanced manufacturing engineering at General Motors Corp.

and one of the founders of the MAP/Technical and Office Protocol movement.

“All we meant was that we wouldn’t add any technologies that are incompatible with 3.0 and that make it obsolete,” Kaminski said. “We never said we’d stop putting new technologies into MAP. We want vendors to realize that their investment in 3.0 products will be good for several years.”

Kaminski said a new version of MAP with support for fiber and the common MMS interface could be released later this year or in early 1990. Both technologies are fully compatible with MAP 3.0, he said.

### Two standards ready

Kaminski said the MAP/TOP Users Group and other standards bodies have only recently completed work on specifications defining how the MMS interface and fiber cables would work in a MAP net. Users are eager to implement both technologies, Kaminski said, because they can alleviate some factory networking problems. Currently, the MAP standard specifies only use of copper  
(continued on page 24)

## BOOK REVIEW

BY ERIC SCHMALL

## Coping with today’s information anxiety

*Information Anxiety*, Richard Wurman (New York: Bantam Doubleday Dell Publishing Group, Inc., 1989), \$19.95.

**C**ommunications managers are building networks that carry ever greater amounts of information. As such, they’re one of the prime instigators, as well as one of the victims, of the malady described in *Information Anxiety*.

Information anxiety, according to Richard Wurman, is bewilderment brought on by an excess of information. That anxiety is spreading as the amount of data available to people skyrockets. More than 1,000 books are published every day, Wurman writes. The total of all printed knowledge doubles every eight years. A typical Sunday edition of the New York Times contains more text than the average 17th century European read in a lifetime.

*Information Anxiety* is about coping with the glut of information in the information age. It presents strategies for assimilating the flood of data and for presenting information more palatably. As such, communications managers could benefit from reading this book.

Wurman, an architect by training, specializes in finding simpler ways to present information to people. Among other things, he designed the Pacific Bell Yellow Pages and a series of  
(continued on page 51)

*Schmall is network systems manager for an insurance holding company.*

## MANAGEMENT PROFILE

BY WAYNE ECKERSON



Sam Stafford, Supermarkets General’s corporate telecom director

## Grocery chain gets an edge from technology

By Wayne Eckerson  
Staff Writer

WOODBIDGE, N.J. — Supermarkets General Corp. is pursuing an aggressive network strategy that has helped it become one of the leading regional retail food chains.

Two years ago, the privately held company began building a Ku-band very small aperture terminal satellite network to connect its supermarkets and stores. According to Sam Stafford, director of corporate telecommunications for the company, the VSAT net is the first of its kind in the retail food industry.

Today, Stafford and his department are busy investigating a host of other network technologies, from electronic data interchange to in-store video advertising. These technologies will enable the chain to offer a greater number of products and services at lower prices than its competitors, he said.

“When I came to Supermarkets General, my job description said I was supposed to be ‘creative and innovative’ in finding new network technologies that would add to the bottom line,” Stafford said. “Management has held us to that standard, which is what makes this an exciting place to work.”

Risk-taking is not a characteristic many people associate with the retail food industry, where profit margins are slim — usually 2% or less.

“We may be given a free reign to innovate, but we have to prove [the value of] every step we take, more than communications managers in more cash-rich industries,” Stafford said.

Still, Stafford believes management at Supermarkets General satisfies its cost-cutting in-

stincts without sacrificing a commitment to networking.

“Management doesn’t see us as a necessary evil but as people who can effectively increase the company’s market share,” Stafford said. “As a result, we end up winning a lot more than we lose.”

### Regional integrated net

Supermarkets General owns and operates 285 stores, which are located mostly in New Jersey, Pennsylvania, Connecticut and New York state. Its largest holdings include Pathmark supermarkets and drug stores, Purity Supreme, Inc. supermarkets and Rickles Home Centers. The firm employs 55,000 people and is New Jersey’s largest employer.

Each store is equipped with an IBM Series/1 minicomputer linked on-line to IBM 3081 and 3084 host computers at headquarters here, as well as with in-store point-of-sale scanners and registers. All stores are linked to headquarters via either multi-drop leased lines running at speeds ranging from 2,400 bit/sec to 1.544M bit/sec or 56K bit/sec VSAT satellite links.

The network enables store managers to access sophisticated applications, such as employee scheduling, payroll and electronic mail, residing on host computers. It also allows headquarters to coordinate pricing and purchasing for all stores.

Daily pricing updates are sent via the network directly to POS scanning machines. In turn, store managers submit their orders via Series/1 terminals to headquarters here.

The network allows the company to order and stock supplies at its regional warehouses and distribution centers more efficiently  
(continued on page 24)





A Pathmark store in New York.

## Grocery chain gets an edge

continued from page 23

ciently. Host computers compile sales data from POS scanners at all stores, which allow top management to track purchasing trends. Management can then increase or decrease orders for goods depending on how quickly or slowly those goods are moving through the stores.

According to Stafford, the primary advantage of moving to the VSAT network is that it stabilizes data transmission costs. Supermarkets General signed a seven-year fixed-price rental contract with GTE Spacenet Corp. that allows the company to use GTE Spacenet's satellite hub atop New York's World Trade Center.

Currently, 65 Supermarkets General stores are equipped with VSATs and at least 85 more will

soon be linked via satellite, Stafford said. "Since divestiture, leased-line rates from carriers have fluctuated greatly, making it a nightmare to estimate costs from year to year," he said.

The satellite network also significantly reduces the lead time for bringing sites onto the network, Stafford said. Carriers might take from one to three months to install a new circuit, whereas VSAT terminals can be installed on a rooftop and be transmitting data within two weeks, he said.

Moreover, satellite communications can bring stores a competitive advantage, Stafford said. By transmitting data between all stores and host computers at 56K bit/sec, headquarters can accommodate just-in-time shipments of products to stores. This allows stores to reduce the size of their stock rooms and dedicate additional floor space to displaying a greater variety of goods.

The ability to display more items is critical as supermarkets and general merchandise stores, such as K mart Corp. stores, move toward one-stop shopping, Stafford said. Supermarkets General needs to provide nonfood items, such as automotive supplies, video rentals, film processing and books, to compete successfully today, he said.

When presenting his case for the VSAT network to upper management, Stafford recalled, he said satellite technology would support a wide range of new applications. Among those applications is video broadcasting, which the company can use to train employees and advertise products in its stores.

Stafford said he is working to place on store shelves small LCD screens that food producers can use to advertise their goods. Larger LCD screens will be installed elsewhere in the store to advertise markdowns, sales, and new items and services offered by the store. Data for the advertisements will be transmitted from headquarters to the screens over the VSAT net. ■

## Users group mulls upgrade

continued from page 23

wiring in carrierband and broadband MAP networks. Copper's performance can degrade in areas with a great deal of electromagnetic noise, such as near a furnace. Fiber is impervious to electrical noise and many users want to use it in MAP networks.

The MMS interface, if adopted by factory network application vendors, would alleviate the need for users to customize applications to work with MMS, Kaminski said. Few vendors currently provide quality interfaces between their network applications and MMS, Kaminski said. Including a standard MMS interface in MAP would encourage vendors to do a better job of this, he said. ■

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# PRODUCTS & SERVICES

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## Worth Noting

See inside for:

- IDEAssociates' OS/2 Presentation Manager interface
- A CCITT V.32-compatible modem and a 32-channel statistical multiplexer from Multi-Tech
- Mux Lab's new balun for linking thin-wire Ethernets using twisted pair

## First Look

### Gateway offers fast Ethernet adapter

**Gateway Communications, Inc.** introduced an updated version of its G/Net LAN adapter board that supports higher transmission speeds than previous versions.

The **G/Net Variable Speed (VS) LAN** adapter resides in IBM Personal Computer XTs, ATs and compatibles as well as IBM Personal System/2 Model 30s attached to networks running Novell, Inc.'s Advanced NetWare or System Fault Tolerant NetWare net operating systems.

The G/Net VS LAN adapter supports a maximum transmission speed of 7.16M bit/sec. The previous G/Net LAN adapter board supported a top speed of 1.43M bit/sec.

The G/Net VS LAN adapter additionally supports a dynamic interpacket switching technique that enables it to drop its speed to 1.43M bit/sec in order to communicate with network devices outfitted with a G/Net LAN adapter and increase its speed to up to 7.16M bit/sec when communicating with devices outfitted with a G/Net VS LAN adapter.

Gateway's NetWare-based G/Net local networks support up to 50 nodes on RG58, RG59 or RG62 coaxial cable that can be up to 2,000-ft. long.

The G/Net VS LAN adapters are available now for \$595 each.

*Gateway Communications, Inc. 2941 Alton Ave., Irvine, Calif. 92714, or call (800) 367-6555 or (714) 553-1555.*

*(continued on page 28)*

## NetWay unit plays many LAN roles

By Jim Brown  
New Products Editor

SAN JOSE, Calif. — NetWay Technology, Inc. recently announced a stand-alone device that can simultaneously function as six local net devices.

The NetWay Resource Platform (NRP) can be configured to serve as one or more file servers, mainframe gateways, asynchronous terminal servers, printer servers or other local network-attached devices.

The NRP consists of a stand-alone cabinet and power supply that can support as many as six processor boards, 14 IBM Personal Computer AT-compatible expansion boards and four disk drives.

The processor and expansion boards reside in modules that have self-contained back-plane buses. These back-plane modules support between three and 20 board slots.

When inserted into an NRP, these back-plane modules and boards function as separate computing devices.

The use of back-plane modules and an NRP reduces the amount of hardware needed to support a stand-alone file server, a local net-to-mainframe gateway and an asynchronous terminal server.

Typically, three stand-alone IBM Personal Computer ATs would be needed to support what a single NRP and three back-plane modules can support.

For instance, a five-slot back-plane module can be configured

**The back-plane modules support between three and 20 board slots.**

▲▲▲

to act as a file server. Users install into a back-plane module a processor board, a disk drive controller board, a network adapter board, a monochrome monitor board and a serial/parallel printer port board. When inserted into the NRP and linked to a local network, that back-plane module will support access to files and applications stored on one or more NRP disk drives.

Another four-slot back-plane module can be outfitted with a

processor board, a net adapter board, a local net-to-mainframe gateway board and a monitor board. The module can then be inserted into the NRP. This module would enable local net-attached devices to access host files by emulating host terminals.

A third five-slot back-plane module can be equipped with a processor board, a network adapter board, an asynchronous terminal server board and a disk controller board. When inserted in an NRP, this module enables attached asynchronous terminals to access a local network.

An NRP comes in three basic models. The Model 2000 and the Model 3000 come with the same basic package consisting of a single back-plane module supporting five board slots, a monochrome monitor, a keyboard, a monitor adapter board, a serial/parallel printer port board, and a 360K-byte floppy disk drive. Boards supporting local network access, local net-to-mainframe

**The Model 2000 comes with an Intel Corp. 80286 board with 2M bytes of RAM.**

▲▲▲

gateways, or asynchronous terminal server functions are purchased from third-party vendors.

The Model 2000 is supplied with an Intel Corp. 80286 microprocessor board with 2M bytes of random-access memory. It costs \$6,595. The Model 3000 comes with an Intel 80386-based processor board with 2M bytes of RAM and sells for \$7,395.

The Model 3020 comes with two five-slot back-plane modules, 80386 and 80286 processor boards with 2M bytes of RAM each, a monochrome monitor, a keyboard, two monitor boards, a serial/parallel printer port board, and two 360K-byte floppy disk drives. It costs \$10,295.

The monitor adapter board is used to provide a link between a back-plane module and the monochrome monitor. A rotary switch is used to switch connections between monitor adapter boards.

NetWay Technology also sells five-slot back-plane modules that come with only a processor board. A five-slot back-plane module with an 80286 processor board is priced at \$3,095, and one with an 80386 processor board costs \$3,895.

Users can reach NetWay Technology by writing to 101 E. Alma Ave., San Jose, Calif. 95112, or by calling (408) 947-2030. ☐

## Sydney offers X.500 directory package

Canadian firm's software lets users link E-mail directories across X.25 and TCP/IP networks.

By Jim Brown  
New Products Editor

VANCOUVER — Sydney Development Corp. recently unveiled software that enables developers to build an X.500 electronic mail directory for use in X.400 and other E-mail nets.

In what could be the first implementation of CCITT X.500 directory standards, Sydney Development's Directory 500 software helps developers build applications that link X.500-compatible E-mail directories residing on multiple systems in an X.25 or Transmission Control Protocol/Internet Protocol network. Directory 500 can be used to provide directory services for existing X.400 E-mail gateways as well as other proprietary E-mail gateways.

Written in C language, different versions of Directory 500 can run under operating systems that include Unix, MS-DOS, Digital Equipment Corp.'s VMS and IBM's MVS.

With Directory 500, develop-

ers can build a Directory User Agent (DUA) application, a Directory System Agent (DSA) application and a Directory Information Base (DIB) data base.

The DUA is client software running on an end-user system such as a Unix- or MS-DOS-based microcomputer. The DSA is server software that typically runs on larger multiuser systems such as DEC VAX minicomputers and IBM mainframes.

The DIB is a data base that contains information about each user on an E-mail network. Data stored in a DIB includes such information as a user's telephone number, job title, postal address and E-mail network address. A DIB can be distributed across multiple systems running DSA software.

DSA software is required on each system to control access to the portion of the data base stored on that system and to establish links with DSA software on systems supporting other por-

*(continued on page 29)*

## Digitech unveils hand-held network protocol analyzer

RIDGEFIELD, Conn. — Digitech Industries, Inc. recently announced a hand-held protocol analyzer that supports many of the same functions of the company's larger, higher priced units.

The DS300 is a stand-alone device with an eight-line LCD display screen, keyboard and read-only memory-resident software. The unit weighs less than three pounds and includes a rechargeable battery or an alternating current adapter.

The DS300 attaches to data terminal or data communications equipment via an RS-232 port and captures protocol data at up to 64K bit/sec.

The device's software is used to decode protocols and display information about each field in real-time. The device can also store as much as 128K bytes of protocol data in random-access memory.

Operated with menu-driven software commands, the DS300 analyzes IBM's Synchronous Data Link Control and Binary Synchronous Communications protocols, as well as X.25 and asynchronous protocols. The

DS300 can automatically detect the protocol being used on a communications line as well as the speed of the line.

The DS300 can be used to test configuration of network equipment, monitor troublesome data lines, perform bit error rate tests, generate test protocol patterns and emulate an asynchronous ASCII terminal.

The DS300 includes a Centronics-compatible printer port, enabling users to print protocol analysis data on an attached printer. Users can also upload protocol data stored in the buffer of a larger protocol analyzer via a modem.

The DS300 costs \$1,995.

Digitech Industries' larger systems can analyze a greater number of protocols. The larger systems also support a variety of physical interfaces, including V.35, RS-449 and X.21, and they include disk storage capability. The larger systems are priced between \$4,000 and \$15,000.

Users can write to Digitech Industries at 66 Grove St., P.O. Box 547, Ridgefield, Conn. 06877, or call (203) 438-3731. ☐



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**Maybe you’re buying the wrong modems.”**

—Ed Hines, Engineering and Quality Director of  
AT&T manufacturing plant, Montgomery, Illinois

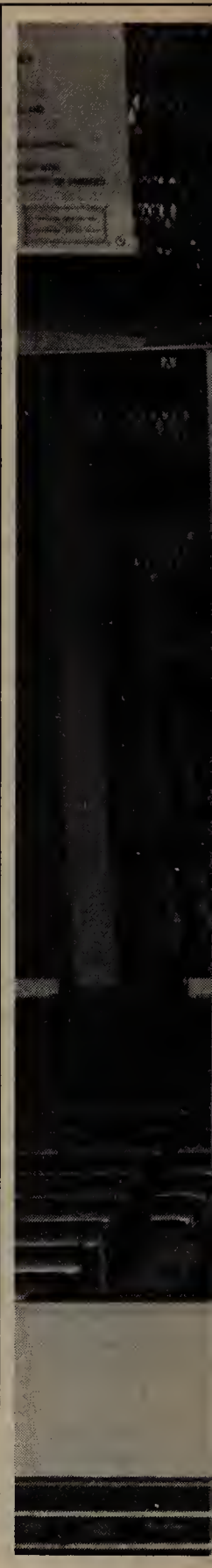
“No one would blame you for being frustrated.

You’ve spent millions on an information system because it’s critical to your business and when it goes down it can drive you crazy. Very often there’s a very simple reason for what’s going wrong and it may not be the computer at all.

Maybe it’s the modem.

If your data transmission is important enough for you to use the AT&T Network, it’s important enough for you to use AT&T DATAPHONE® II data communications equipment.

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While other vendors' equipment is often checked randomly for quality, every single one of the AT&T units we make is tested. Not once, but three times. Each component is subjected to three different environmental tests simultaneously: temperature variations, power cycling and loop-test patterns. That's

unique to the industry.

This results in AT&T data communications equipment having among the highest mean time to failure rates of any in the industry. Up to 17 years for AT&T data service units.

If your information system is priceless, don't skimp on the one thing that can make it worthless."

For more information about AT&T **DATAPHONE II** data communications equipment, see your AT&T Account Executive, your authorized AT&T Reseller or call 1 800 247-1212, ext. 716. In Canada, call 1 800 387-6100.



**AT&T**

The right choice.



**IDEAssociates, Inc.** recently added an OS/2 Presentation Manager interface to its line of microcomputer-to-minicomputer link products.

**IDEAcomm 5251/OS** software runs on IBM Personal Computers and IBM Personal System/2s that are also running OS/2 Presentation Manager. The software works with IDEA Associates' IDEAcomm 5251/Plus adapter board and enables microcomputer users to appear to IBM's Application System/400 and System/3X minicomputers as an IBM 5251, 5292, 3180, 3196 or 5291 terminal. IDEAcomm 5251/OS uses OS/2 fonts that automatically scale themselves to provide full 132-column IBM 3180 terminal emulation, thus eliminating the need for scrolling. IDEAcomm 5251/OS also enables Personal Computer-attached printers to emulate IBM 5224, 5225, 5256, 4214 and 5219 minicomputer system printers.

With IDEAcComm 5251/OS, users can access corporate data on an IBM minicomputer, download it into OS/2 applications for editing or manipulating, and then upload it back to the minicomputer. IDEAcComm 5251/OS operates as a Presentation Manager application, supporting mouse input and multiple-window display of text and graphics. An icon interface lets users toggle between as many as seven concurrent minicomputer sessions.

The IDEAcomm 5251/OS software package costs \$495 and will be available next month. The IDEAcomm 5251/Plus board is priced at \$645.

*IDEAssociates, Inc., 29 Dunham  
Road, Billerica, Mass. 01821, or call  
(508) 663-6878.*

**Multi-Tech Systems, Inc.** recently announced a rack-mountable CCITT V.32-compatible modem and a 32-channel statistical multiplexer.

The **MT932ER** modem supports synchronous or asynchronous communications, in full- or half-duplex mode, over two-wire dial-up or leased lines. The modem incorporates Hayes Microcomputer Products, Inc.'s AT command set. It also supports up to Class 5 of Microcom, Inc.'s Microcom Network Protocol. The new modem resides in a Multi-Tech CC916 rack that can support as many as 16 modems.

The modem is priced at \$1,050 and is available now.

The **MultiMux32** supports dual composite leased-line trunks and as many as 32 pieces of data terminal equipment (DTE). The trunk lines are supported by internal modems operating at speeds of 9.6K bit/sec or 14.4K bit/sec. As an option, the multiplexer can be attached to an external modem that supports a trunk line speed of 19.2K bit/sec.

The MultiMux32 uses channel auto-bauding to automatically adjust to the speed of the DTE. A built-in command modem enables network management personnel to establish remote testing and technical support as if the user were connected locally.

The MultiMux32 joins existing MultiMux units that support eight, 16 and 24 channels. A MultiMux supporting eight channels and no internal modem costs \$3,495.

A MultiMux32 supporting 32 channels and two internal 14.4K bit/sec modems is priced at \$10,295. MultiMux32 is scheduled to ship in April.

*Multi-Tech Systems, Inc., 2205  
Woodale Drive, Mounds View, Minn.  
55112, or call (612) 785-3500 or (800)  
328-9717.*

**Mux Lab, Inc.** introduced a balun that enables users to replace RG58 coaxial cable used in thin-wire Ethernets with unshielded twisted-pair cable.

The **Etherbalun** is used to link IBM Personal Computers and other thin-wire Ethernet devices to a wall outlet that sup-

ports twisted-pair wire. This cabling technique lets users locate multiport repeaters used in thin-wire Ethernets in wiring closets instead of in an office area. Locating multiport repeaters in wiring closets eases the task of adding users to the net or moving users to different locations.

The product features a male BNC connector that connects to a thin-wire Ethernet transceiver, a multiport repeater or a thin-wire Ethernet controller card. It also has a modular jack that plugs into a wall plate.

The Etherbalun can work with thin-wire Ethernet equipment from such vendors as 3Com Corp. and Digital Equipment Corp. It supports transmission speeds of 10M bit/sec for a maximum of 330 feet.

Each Etherbalun costs \$75 and will be available next month.

*Mux Lab, Inc., 165 Graveline, St. Laurent, Que., Canada H4T 1R3, or call (504) 735-2741.*

**FTP Software, Inc.** introduced a version of its IBM Personal Computer-based PC/TCP software that runs in conjunction with other vendors' MS-DOS-based versions of LAN Manager client software.

The new version of **PC/TCP** lets Personal Computers concurrently run Transmission Control Protocol/Internet Protocol and LAN Manager client protocols on one net adapter board. Previously, Personal Computers required one net adapter board to support TCP/IP and another to

# How Networks Talk W

They don't. Confused, interrupted, unproductive communications are the usual result when you try linking large networks together. So far, creating an environment where users have access to every computing resource has been a frustrating, elusive goal.

But this situation is changing, with help from the pioneer in high-performance networking—Network Systems. Our HYPERchannel® network brings together Cray, IBM, DEC, Control Data, Hewlett-Packard, and dozens of other processors and peripherals on a single network; a network



support LAN Manager client protocols.

With the new PC/TCP version, Personal Computers can use LAN Manager client software to attach to file servers running LAN Manager server software. They can also use PC/TCP to attach to other network devices that support TCP/IP.

The software supports a driver interface that is compatible with the Network Device Interface Specification (NDIS). Developed jointly by 3Com Corp. and Microsoft Corp., NDIS lets one network adapter board handle multiple net protocols.

The NDIS-compatible version of PC/TCP is priced at \$175 per copy for a 20-user license. The software is scheduled to ship next month.

FTP Software, Inc., 26 Princess St., Wakefield, Mass. 01880, or call (617) 246-0900.

## Sydney offers X.500 directory package

continued from page 25  
tions of the DIB data base.

With Directory 500, developers can build applications that enable end users to browse through a DIB to find a specific user's E-mail address.

Users can enter a few elements of an E-mail address and obtain the full address of users who have that information in their addresses. Users can also verify E-mail addresses and determine the data communications capabilities of a recipient.

To support those functions, DUA software is used to connect an end-user computer to a system running DSA software. The DSA software then issues commands to retrieve information from the data base

that resides on local or remote systems and to transmit that data to the end user.

DUAs establish links with DSAs using the CCITT Directory Access Protocol. Communication between DSAs is supported by the CCITT Directory System Protocol. Both protocols are based on the CCITT's recommended X.500 standards.

### Pricing

Directory 500 software is available in source code format for various operating systems and has an average price of \$150,000. In addition, users pay a \$15 fee for each microcomputer or terminal attached to the E-mail network.

Sydney Development can be reached by writing to 1385 W. Eighth Ave., Vancouver, B.C., Canada V6H 3V9, or by calling (604) 734-8822. **Z**

## Calendar tool gets wide-area network option

By Susan Breidenbach  
West Coast Bureau Chief

BOSTON — Action Technologies, Inc. recently announced a wide-area network option for its scheduling software and a gateway to MCI Communications Corp.'s MCI Mail.

At the NetWorld/Boston '89 conference, Action Technologies introduced a Group Calendars add-on to The Coordinator II, a scheduling and calendar software package that runs on Novell, Inc. NetWare local networks.

Group Calendars lets users link individual, work group and company schedules across wide-area nets. It incorporates Powercore, Inc.'s Network Scheduler software and Action Technologies' Message Handling Service. The Message Handling Service is a store-and-forward mechanism for local- and wide-area networking.

According to Tom White, president of Action Technologies, Group Calendars "is the first product to integrate electronic mail with calendar capabilities outside of the local work group. No other applications, including E-mail applications running on minicomputers and mainframes, provide the capability for users to access and integrate calendars with E-mail on a corporatewide basis."

Group Calendars enables users to sign up for shared resources and resolve time conflicts. An entry on one calendar will automatically update related calendars, even across a wide-area connection.

Group Calendars costs \$245 for a stand-alone version, \$595 for five users and \$995 for 30 users. It will be available in May.

The company also pledged to roll out in the second quarter a gateway for users of The Coordinator that will enable them to access MCI Mail using On-Site Information Systems, Inc.'s M-Bridge.

The product, which serves as a gateway between the Message Handling Service and MCI Mail, is being jointly marketed by On-Site Information Systems and Action Technologies. It links The Coordinator and any other Message Handling Service application to MCI Mail's store-and-forward services, including its X.400-based service.

The MCI Mail connection also gives users of The Coordinator access to a variety of minicomputer and mainframe E-mail environments, including Digital Equipment Corp.'s All-In-1, IBM's Professional Office System and Wang Laboratories, Inc.'s Wang Office.

M-Bridge will be available in May from On-Site Information Systems. Pricing ranges from \$595 for five users to \$1,195 for 20 or more users.

The company also announced MacAccess, software that will enable Apple Computer, Inc. Macintosh users to work with The Coordinator on a Novell local network supporting NetWare 2.15.

Scheduled for release at the end of June, MacAccess lets Macintosh users exchange messages with users of The Coordinator on the network and gives them access to all the gateways currently available for the Message Handling Service, including M-Bridge.

The product is priced at \$345 for five users. **Z**

well xmit data via U.S. Mail

FORGET IT—JUST DUMP IT TO TAPE AND  
16

CONTINUE ∞

WRITE (6,103) X

GO TO 1 CALL FOR AUTHORIZATION

WRITE (6,102) X,

GO TO 1 bits

STOP X

END (0 X =

0103 0500 0050 0024 0021  
009E 0000 0400 0100 0103  
00RE 0000 0178 FF28 023C  
0303 0100 0035 0000 0025  
023F FEC1 0002 0002 0000  
0001 FE54 0200 0100 0303  
0026 11C7 0037 FFFF 023E  
0203 0200 0035 0000 0025  
SEYMOUR WHO?

## When We're Not Around.

that moves information at channel speeds.

And now, our HYPERchannel-DX and IP Router products *network the networks* by integrating a variety of protocols and media standards. That means all your isolated networks can now work together, giving you greater connectivity,

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# OPINIONS

## NETWORK MANAGEMENT

BY JAMES HERMAN

# To once again be leader of the pack, IBM must act

In the spring of 1986, IBM made a major strategic move by announcing its open communications architecture, which included open network management interfaces. The company also unveiled NetView, its strategic product for network management, and NetView/PC, a product that brings other vendors' network management data into NetView. These announcements gave IBM the early lead in integrated management of multivendor environments.

A year went by without significant response from other vendors. Then, in the spring of 1987, IBM introduced NetView Release 2 and boldly announced that NetView was its strategic product for operating system and subsystem management. IBM declared its intention to concentrate on automated management of the data center and the network. At a time when most other management systems were touting flashy color graphics, IBM seemed to be concentrating on real user requirements, not marketing gimmickry.

But in the nearly two years since those announcements, IBM has lost its momentum.

In the fall of 1987, AT&T announced its Unified Network Management Architecture, which offered an Open Systems Interconnection-based alternative to NetView for multivendor integration. In the spring of 1988, when IBM failed to make new network management announcements, AT&T moved further to strengthen its position. First, the carrier announced a joint development agreement with Cincom Systems, Inc., IBM's only serious competitor for managing Systems Network Architecture networks. Second, AT&T was instrumental in establishing the OSI Network Management Forum to expedite the implementation of OSI management interfaces.

Then, in the summer of 1988, Digital Equipment Corp. jumped into the fray by announcing its OSI-based Enterprise Management Architecture, which stressed a distributed approach to network and system management.

In autumn 1988, IBM announced NetView Release 3, which offered no major initiatives and instead concentrated on minor enhancements to NetView that seemed motivated by the need to counter features of competitors' products. For example, IBM offered REXX, a procedural language for automation, something Cincom had been offering for years. Big Blue also brought out an OS/2 version of NetView/PC, which had been widely dismissed as a failure. Forced to react to OSI, IBM issued general statements that contained no timetable for implementation.

This January, AT&T unveiled Accumaster Integrator, the first major OSI-based management system on the market. The product, which features a workstation interface and an OSI-based link to Cincom's Net/Master, received a lot of attention at the Communication Networks Conference and Exhibition '89. Today, more than 40 companies have joined the OSI Network Management Forum, making OSI the clear industry direction for multivendor network management.

Just weeks ago, in what appeared to be an attempt to quell rumors about the sorry shape of its development efforts for NetView, IBM defended NetView and NetView/PC. This is surely a sign of desperation for IBM, which used to make preemptive product announcements and set the pace in network management. In the last eight months, IBM has been increasingly on the defensive. Its announcements are now driven by a need to react to others rather than to stake out strategic high ground.

IBM's ability to deliver sound technology that is important to users is seriously in question. To regain its lead, IBM must stop reacting and learn to act. ■

*Herman writes, teaches and consults on telecommunications technology with Northeast Consulting Resources, Inc. in Boston.*

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Box 9171, 375 Cochituate Road  
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**Assistant Managing Editor — Production**  
Beth Lazarus

**Associate Editors**  
Peter Hoffmann  
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**Copy Editors**  
Liz Pappas  
Tom Smith

**West Coast Bureau Chief**  
Susan Breidenbach

**West Coast Correspondent**  
Sarah Vandershuf  
501 Second Street, Suite 600  
San Francisco, Calif. 94107  
(415) 978-3160

**Washington, D.C. Bureau Chief**  
Anita Taff

**Washington, D.C. Correspondent**  
Gail Runnoe  
650 National Press Building  
529 14th Street NW  
Washington, D.C. 20045  
(202) 347-6184

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## EDITORIAL

# Serving users remains Network World's goal

A lot has changed at *Network World* since our first issue appeared on March 24, 1986.

In the three years and roughly 150 issues since then, our staff has expanded significantly. We've added editorial personnel and support staffers in our Framingham, Mass., newsroom and in our bureaus in Washington, D.C. and San Francisco.

We've also changed our design dramatically.

*Network World* has been a leader among trade publications in the use of color and graphics. While other publications are only now experimenting with these advancements, we continue to refine our charts and informational graphics as well as our use of color. These are important tools for helping readers understand complex issues.

Building on the innovative aspects of our original design, we undertook a redesign last year to make the publication even more useful to our readers. Among other things, we changed typeface and headline styles, renamed sections, rebuilt the table of contents, and developed new columns and brief news files designed to make it easier for readers to find and digest the news.

In addition to improving our look, we've enhanced our already impressive Features section, which is without rival among newsweeklies.

We expanded the number and scope of our Buyer's Guides, designed to help users sort through the myriad of network products.

We've added Industry Focus sections, which target particular vertical markets such as insurance and banking. We've also added Management Updates to give network managers an in-depth look at key issues.

What's more, we've improved our annual budget and salary surveys, and expanded our User Excellence Awards, which honor the most innovative network users. Our Opinions section has also been improved with the addition of

**C**ontinue suggesting ways for us to improve, to keep the partnership growing.

▲▲▲

outspoken new columnists.

These improvements go hand in hand with the recent changes we've made to improve the way we handle breaking news, including restructuring beats to enhance our coverage of key technologies, issues, vertical industries and management concerns.

But one thing hasn't changed — and won't.

Our original aim was to provide the best news and features for *users* of network products and services. That's still our goal.

Other publications have grafted some user coverage onto their original vendor-oriented frameworks. But *Network World* remains the only communications publication devoted solely to users.

That dedication has been rewarded in readership studies among key user organizations such as the International Communications Association and Tele-Communications Association, Inc. Those studies have shown that users find *Network World* to be the most useful communications publication.

We want to keep users informed about news that affects their networks. And through our features, case histories, trend stories and other articles, we strive to help users understand how innovative use of network technology can give their companies a competitive edge.

Over the years, you've helped us improve *Network World* through your letters and your responses to our reader surveys, as well as through telephone calls and personal contacts. You've given us news tips and suggestions for improving our coverage and design. You've praised us and criticized us. For that, we thank you.

As we head into our fourth year, we ask you to continue suggesting ways for us to improve, to keep the partnership growing. It's an honor and a challenge serving our readers. With your help, we can serve you better. That's our mission for the coming years. ■



# OPINIONS

## SMART CARD TECHNOLOGY

BY JAMES KOBIELUS

### To navigate networks, users should do as the Romans did

The ancient Romans used a neat trick to memorize speeches. A speaker would hold in his mind the image of a building with many rooms. When delivering the talk, he would "walk" through this imaginary edifice and open a series of doors.

Behind each door was a room containing a set of objects cuing the speaker to the topics to be covered. For example, a spear might represent the nation's military readiness; a sundial, the concept that time is running out.

Users trying to navigate the intricacies of a network can call on this same mnemonic trick by viewing their network as a house with many rooms. Usually what we see are unfamiliar and uninviting "doors" such as terminals, operating systems, logon procedures and command sets. We need to find out how to open them, what lies beyond them and where the resource — the application, data, utility or user — that we're seeking is located.

First and foremost, we need to know where we are and where to turn next. The ideal communications system should provide us with a ground-level mental map, such as a branching menu tree, directory, iconography or other schematic, in which there is always a moving pointer saying "you are here."

An aerial view of the network — the vantage point given in many technical publications — is of little help when you're groping for a doorknob in a darkened corridor. Intellectual curiosity aside, we really don't need to know which boxes are connected by which wires running which protocols. Our map should show only the logical landmarks and spare us the physical details of the paths.

There are, in general, two ways to cut through the clutter and open the doors. The first path is currently the focus of intense industry efforts, while the second hasn't been seriously investigated yet. But it should be.

The first solution is, of course, to develop interface and communications standards. The rationale is that if we can't reduce the number of doors, at least we can minimize the differences among them. We can and do engineer doors (that is, sys-

tems) that open other doors, which trip still other doors. And we can and do design graphic-and icon-driven user views (that is, windows) that tell us where the doors are and what lurks behind them.

The second, largely unexplored way to open stubborn doors is to use smart-card technology. The full network potential of smart cards has yet to be imagined. These devices — wallet-sized cards with embedded computer power and communications ports — are largely being developed as specialized keys. In other words, they are passcards for gaining entry to secure rooms, computers, terminals, data bases and so on.

There is as yet no all-purpose smart-card technology function-

computer workstation capable of interacting with remote applications, downloading and uploading data, and manipulating information locally.

A user-programmable directory of on-line resources would appear on the card's LCD. Card memory would contain the necessary authorization codes and require the use of a personal identification number (PIN) for access to on-line accounts. It would also store a complete profile of the cardholder and his transaction history, ensuring that the network delivered only those resources customized to that person's needs and situation. All this to ensure that the card trips only the appropriate doors and bypasses the rest.

The technologies to implement this dream are very much available. More important, the business rationale for user companies implementing the "value-added speed dialer" is strong. Any business that is driven by a network can gain competitive advantage by improving customer access to the net.

Think of a long-distance telephone company. There's a definite advantage to automating the complex access, authorization and dialing procedure (for example, entering more than 30 digits) that stands between callers and their cross-country destinations. A card-validated PIN would be an invaluable security feature and a card-stored call detail record a very useful portable data base.

And then there are on-line information providers. Audiotex providers can place system menus on speed dialers so that users can navigate those byzantine menu trees entirely off-line. Videotex providers can do the same while expanding their potential market beyond the narrow universe of personal computer users.

Of course, the value-added speed dialer would be applicable anywhere users need quick, flexible, customized access to on-line resources — which means everywhere. A hand-held computer and network access device would be the all-purpose portable transaction tool.

In the future, the smart card will be the key to an on-line world — a world in which doors open doors, which open more doors — as well as a window into that world. **■**

**S**till, it's useless to knock on doors and yell "trick or treat" if you don't have a bag to put the goodies in.

▲▲▲

ing as a universal network access device, but the essential features such a device requires may be outlined. The universal key must apply to the most ubiquitous of terminals — the ordinary, everyday telephone set. And it must be equally at home in the two realms of modern telephony — voice and data.

The technology that fits the bill would be a general-purpose speed dialer, a combination tone generator and acoustically coupled modem.

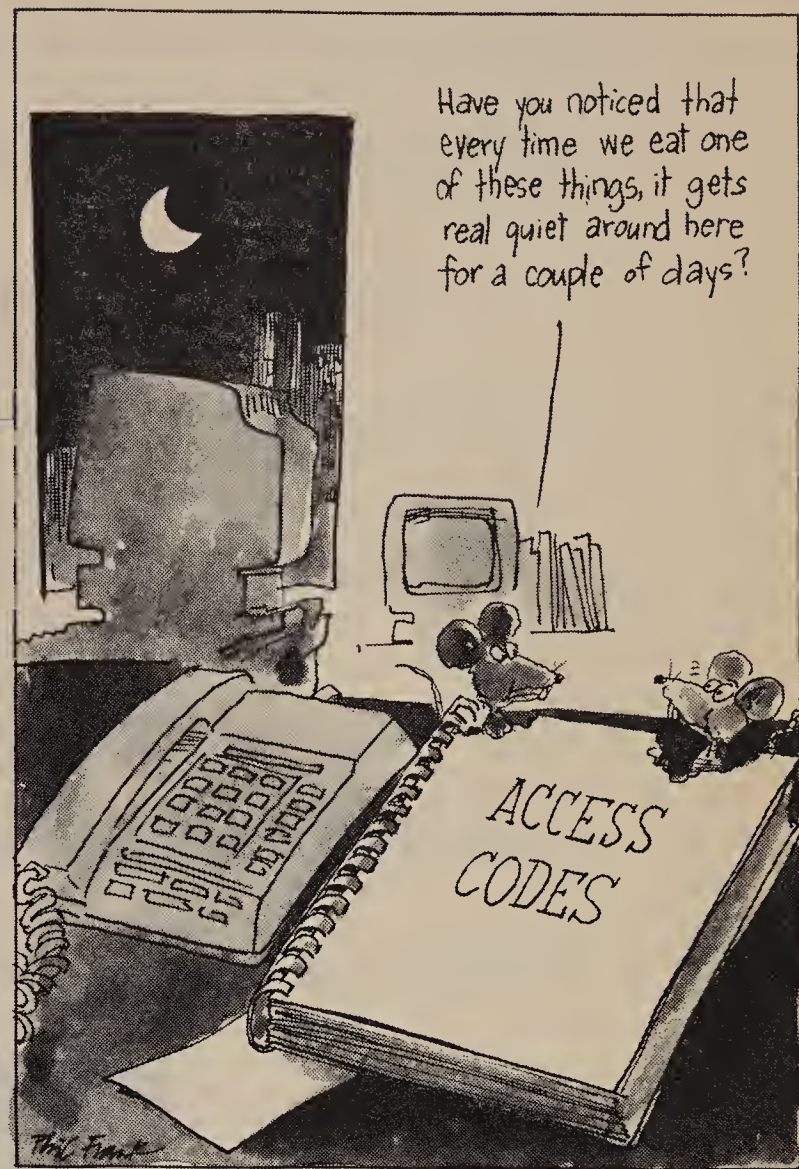
Held flush against the handset, the speed dialer/modem places the call through a rapid-fire series of dual-tone multifrequency and pulse code modulation tones corresponding to destination addresses stored in card memory. These tones would "walk" through the network, establishing paths and unlocking a variety of on-line resources.

Still, it's useless to knock on doors and yell "trick or treat" if you don't have a bag to put the goodies in. The card must be a

*Kobielus consults on information technology in Alexandria, Va.*

## TELETOONS

BY FRANK AND TROISE



## LETTERS

### The multivendor choice

Please refer to a letter to the editor from David Orwick about the subject of single-vendor procurement strategies ("The single-vendor route") in the Feb. 27 issue of your excellent publication.

As a consultant, I too have an opinion on single-vendor procurement strategies, and it is obvious to me why you, as an end-user advocate, have never addressed that subject in your publication.

The reason there are so many vendors offering such a vast array of products to the end-user population is that the major players have demonstrated, over time, an unwillingness to become technological pioneers. Large companies are generally unwilling to take

the risks involved in bringing new technology to the marketplace. Competition in the information industry is the primary lubricant for the development of new technology.

I can imagine what life would be like if IBM had no competition within its end-user population. We would still be living with vacuum tube technology. If AT&T had

*(continued on page 50)*

Network World welcomes letters from its readers.

Letters should be typed, double-spaced and sent to Editor, Network World, 375 Cochituate Road, Box 9171, Framingham, Mass. 01701.

Letters may be edited for space and clarity.

**YOU DON'T NEED A WEATHERMAN** to know which way the wind blows. But in this mercurial industry, everyone needs help charting the proverbial winds of change. You can aid in that effort by writing a guest column for *Network World's* Opinions pages.

Columns should be timely, opinionated, literate, thoughtful and accurate. Manuscripts should be letter-quality, double-spaced and between 600 and 900 words in length. Disk or modem submissions are preferred.

If you'd like to write a column, contact Steve Moore, features editor, *Network World*, Box 9171, Framingham, Mass. 01701, or call (508) 820-2543, ext. 732.





Never underestimate  
the effect an environment  
can have on a situation.



What appears to be out of place in one setting we often find perfectly appropriate in another. It's true in many of the situations that surround us, especially in the business world.

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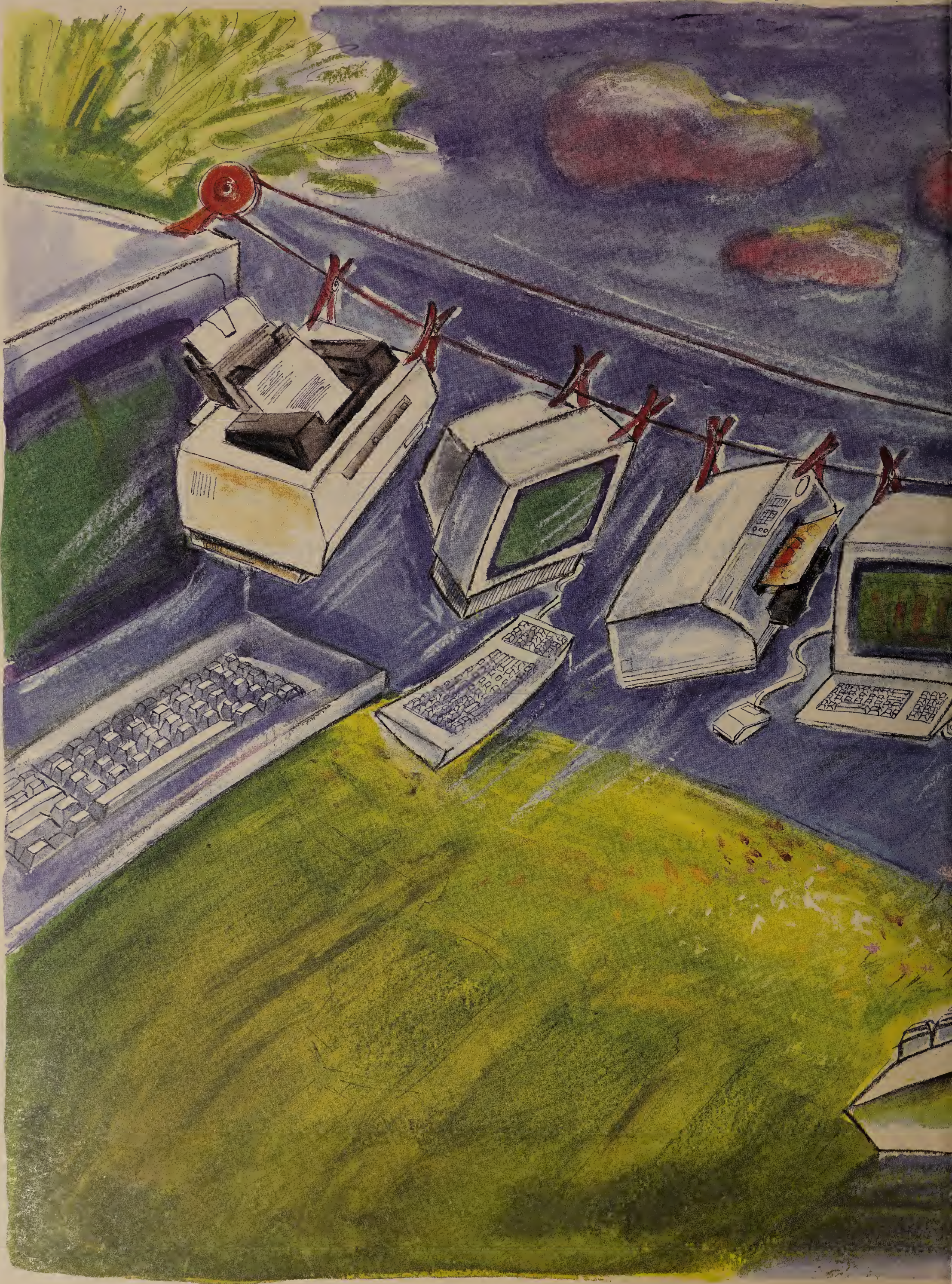
That's why you'll find us studying and researching your business. Asking you questions, listening to your point of view, getting your ideas and doing whatever else we can to understand your company. Its functions, its long-term thinking, and even its problems.

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# Hanging on the line

CONTINUED FROM PAGE 1

local network. Printers, disk drives and tape backups come in "LAN versions." These peripherals are not only bigger and faster, they are becoming more sophisticated. Often, they are packaged with local net software so they can work in concert with local-area nets.

What is a local net peripheral? It can be thought of as a device that falls somewhere between a traditional, stand-alone personal computer peripheral and a more sophisticated local network server. Some examples are printers and plotters, mass storage devices, modems, facsimile machines, tape drive backup systems and uninterruptible power supplies.

What, if anything, distinguishes a local net peripheral from a personal computer peripheral or local net server? The lines of distinction among the three are blurred.

For example, a low-speed printer with an RS-232 interface is a personal computer peripheral, but a higher speed printer with an Ethernet card or additional software for printer spooling and other multiuser functions is a local-area net peripheral on its way to becoming a local net printer server.

These three types of devices are part of a spectrum ranging from single-user personal computer hardware to multiuser hardware and software packages. Different types of peripherals are currently at different points along that spectrum, but

*Horn is project manager with Network Strategies, a Fairfax, Va.-based practice of Ernst & Whinney that provides telecommunications consulting services.*

all local net peripheral technologies are heading toward greater sophistication and local-area network awareness.

## LAN peripheral architecture

The evolution of local net peripherals can be seen in the three different types of network connections used by local net peripherals today (see Figure 1, page 37).

The first type of connection is the traditional workstation interface. Most personal computer peripherals attach directly to a workstation through a serial port such as an RS-232 or a parallel port such as the small computer systems interface.

Most local-area net peripherals today still attach to workstations via a traditional interface. Additional software running on the attached workstation and on other workstations on the local net makes the peripheral a shared resource. The attached workstation may have to be dedicated to the task of controlling the peripheral for architectural or performance reasons.

Most local network administrators choose one of their file servers to be the "workstation" controlling the local net peripheral, which brings us to the second type of network connection: the file server attachment.


File servers are usually high-speed, high-capacity workstations that are centrally located and managed. Many local net peripherals require direct attachment to the file server since the software that controls them can run only on the file server itself.

A third type of network connection for local-area network peripherals is a direct local net interface. Here the peripheral is

*(continued on page 37)*

Personal computer peripherals are becoming more important as they evolve to take on the role of LAN servers.





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(continued from page 35)

more intelligent than a device attached to a workstation or server. The peripheral incorporates a network adapter and can run its own control software. An example is Apple Computer, Inc.'s LaserWriter II, which incorporates an Apple LocalTalk hardware port and a full suite of AppleTalk local net protocols.

Direct local net-attached peripherals must also include their own high-speed processors and on-board memory for executing local-area network protocols and the local net operating system, as well as their own software for providing multiuser sharing of resources.

The Apple LaserWriter II includes random-access memory for buffering print jobs and storing downloaded fonts. Some directly attached peripherals even include mass storage devices such as hard disks for queuing multiple jobs and maintaining audit trails.

The evolution of local net peripherals can also be seen in the use of local net protocols. Figure 2 on this page illustrates how a well-integrated local net peripheral uses communications services provided by the protocols of a local net operating system.

The peripheral, a tape backup device, is locally attached to a file server or a dedicated workstation. The tape backup vendor provides two software components: server and client. Users run client software packages in their workstations. The client component interfaces with the user and transmits backup requests to the server component over the local net.

The client/server software uses an application program interface (API) available on the local network operating system. In this example based on a real product, the API is the industry-standard Network Basic I/O Sys-

tem. Other local net APIs include DOS 3.1's file server interface, Novell, Inc.'s NetWare Value Added Process and more recent OS/2

turns the dedicated printer into a multiuser device by setting up print queues, user menus and directories of printers so users can

1270 printers include multiple feed trays for on-line access to a choice of papers (such as letter, legal, letterhead and envelopes)

Software running on the CD-ROM server and each workstation allows users to read files and directories from the optical drives.

The high-capacity server is useful for storing large, static reference information such as manuals, records or laws. CD-Server software uses the MS-DOS 3.1 file server interface implemented in local net operating systems for DOS. However, the workstation component of Meridian Data's software disables the writing functions when accessing the CD-ROM server.

■ **Modems.** Modem-sharing products are available from third-party software developers and local net operating system vendors such as 3Com.

Most of these products use the same architecture. In this architecture, the actual modem sharing, pooling and queuing is performed by software running on the workstations and on a modem server (for example, a dedicated workstation or a file server). No special hardware is required. Stand-alone modems can be at-

since users may be located some distance away from these devices. To be well-integrated with a local-area network, the printer should make the choice of paper type available to users at their workstations via a menu.

Another important quality of local net printers is a larger paper tray to handle unattended volume printing. On-board memory is required to handle queuing or reconfiguration.

For example, NEC Corp.'s Silentwriter family of printers includes up to 8M bytes of RAM and can be configured with an optional optical disk drive for fonts, queued documents and future software drivers.

■ **Mass storage.** Magnetic hard

locate and submit documents to be printed.

The 1270 series of laser printers from Advanced Technologies International, Inc. is designed for

APIs such as Microsoft Corp.'s Named Pipes, IBM's LU 6.2 and IEEE token-ring 802.2 Logical Link Control.

APIs are important because they provide the applications (that is, local net peripheral software) with communications services, such as sessions. Every local-area net operating system supports some, but not all, APIs.

### Examples of products

The following sections describe the current status of particular local-area network peripherals. Figure 3 on this page provides a summary comparison of local net peripherals using a specific product as an example of each. These products are representative of today's technologies and are not necessarily the most advanced or best performing products in their categories.

■ **Printers and plotters.** Printers were probably the first personal computer peripheral to be shared on a local net. Today, most local net printers are still single-user devices attached via an RS-232 serial port to the net file server. Using software, the operating system (for example, NetWare or 3Com Corp.'s 3+)

local net applications. The 12-page per-minute printing rate is relatively fast, and a print queue buffers what the laser printer can't handle.

The Advanced Technologies

disk drives and optical disk drives are mass storage devices. Sharing disks, directories and files on a single disk drive has become the most popular local net capability.

The software used to control the mass storage local net peripheral has evolved into the local-area network operating system itself, and today's hardware includes specialized hard disk systems for file server use. Thus the magnetic mass storage device has become so integrated with the local net that it is no longer a local-area network peripheral but a true local net server.

However, optical disk drives, also known as compact disk (CD) drives, are not integrated into local-area network operating systems yet. Instead, they — like the other peripheral types described in this article — require additional software to allow multiple users to share them.

For example, CD-Server from Meridian Data, Inc. includes one to six CD-ROM drives attached to a specialized dedicated personal computer, which in turn is directly connected to the local net.

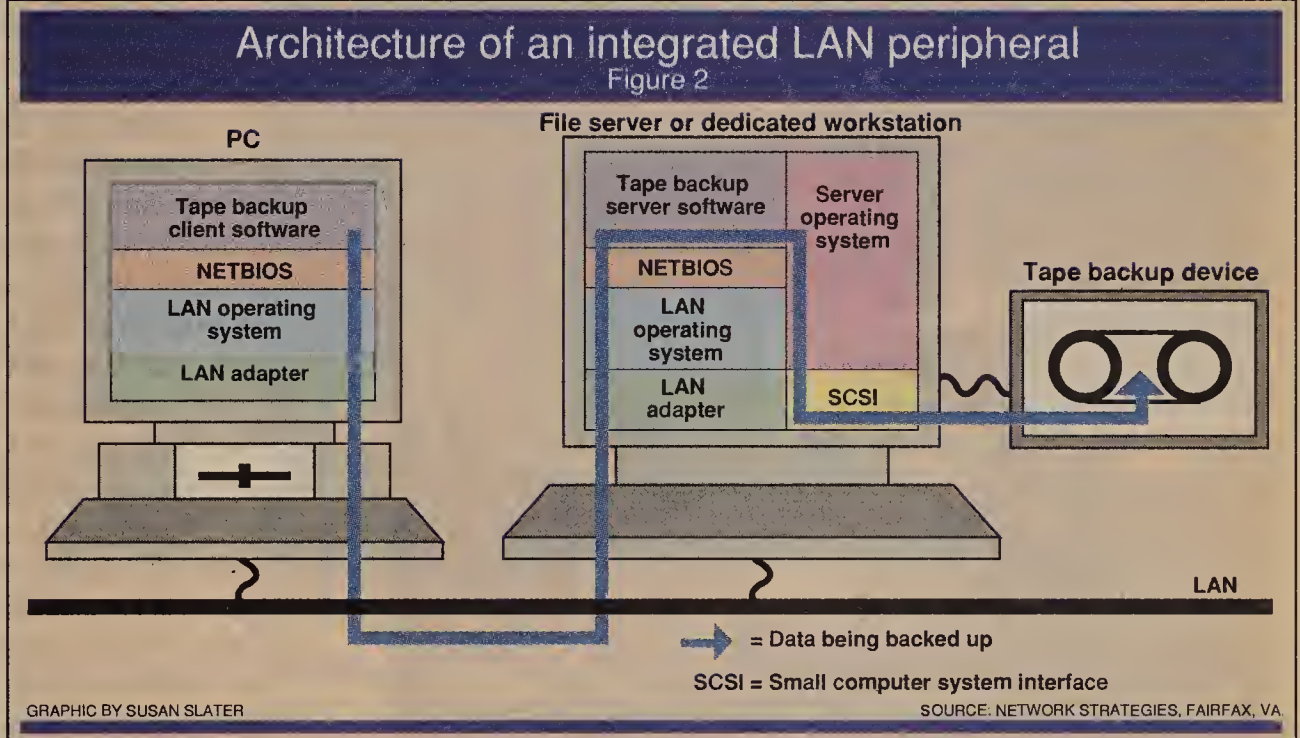
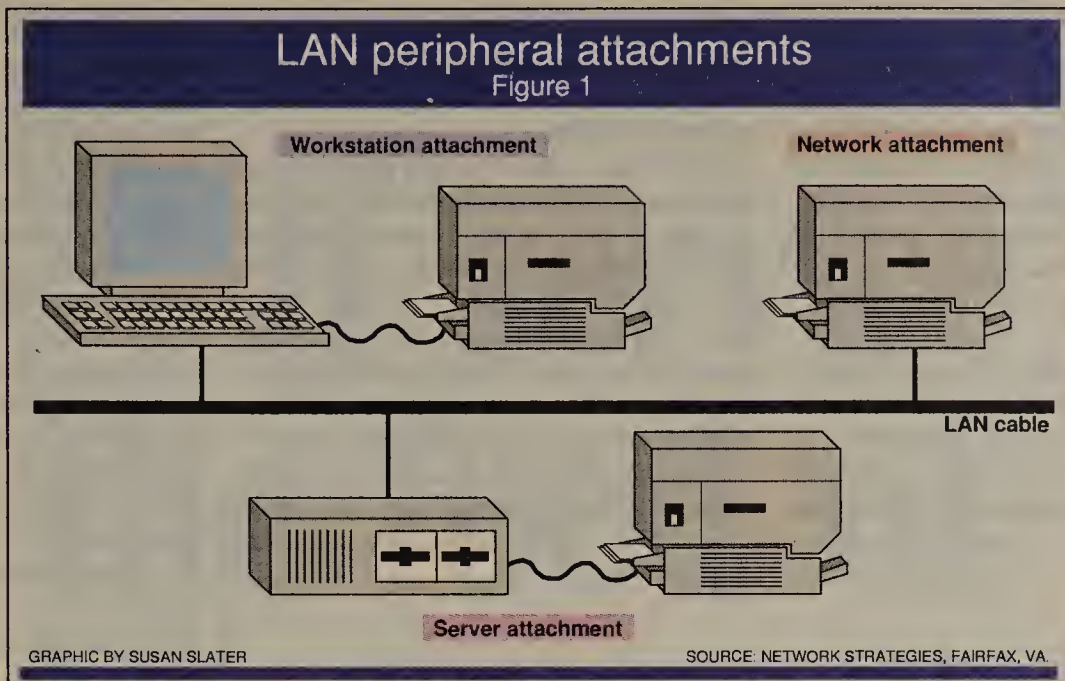
tached via the workstation's or the server's serial port, or modem cards can be plugged into the internal bus of the workstation or server.

Most modem-sharing software makes the shared modems appear to be locally attached to a user's workstation, although the user must first issue a request to use the modem and then may have to wait until a modem is available.

Once connected, a user runs a communications software package, such as Hayes Microcomputer Products, Inc.'s SmartCom, to control the modem, emulate a terminal and perhaps transfer files.

Special local net capabilities of the modem-sharing packages include auditing modem use, limiting connection duration, queuing requests for modem use and monitoring session activity with automatic disconnection of inactive modem sessions.

Note that most of today's modem-sharing software products provide for dial-out only. Dial-in, (continued on page 38)



### Snapshot of LAN peripheral evolution

Figure 3

Peripheral type	Representative product	LAN capabilities	Attachment to network	Protocol or interface used	Integration with LAN operating system*
Printer, plotter	LaserWriter II from Apple Computer, Inc.	Downloadable fonts and driver, print job status messages	Direct	AppleTalk printer access protocol	AppleTalk
Mass storage device	CD-Server from Meridian Data, Inc.	Optical disk server (separate logical drives)	Direct	DOS 3.1	None
Tape backup device	Tape Backup Server from Emerald Systems Corp.	Workstation and server backup, remote operation, automated backups	File server	Novell, Inc. NetWare value-added process	NetWare
Modem	NetModem from Shiva Corp.	Dial-in and dial-out, user notifications of availability and incoming calls	Direct	AppleTalk session protocol	AppleTalk
Facsimile machine	Faxway from Compaq Software International, Inc.	Queues facsimile jobs, and translates E-mail messages, text and graphics files to facsimile	Workstation	3Com Corp.'s 3+ Mail	3+
Uninterruptible power supply	520ES from American Power Conversion Corp.	Protects server, notifies users of power status	Server	Monitoring interfaces (specific to LAN operating system vendors)	NetWare, 3+, Banyan Systems, Inc.'s VINES

\*Uses features of a LAN operating system specific to a LAN operating system vendor (for example, user menu and name directory)

SOURCE: NETWORK STRATEGIES, FAIRFAX, VA.



(continued from page 37)

whereby remote workstations with modems and the appropriate software can access the local net, is not currently required as much as dial-out. Some packages are specially designed to provide dial-in, while a few support both dial-out and dial-in.

Dial-in local net access is a potentially large market, but current products are limited because they do nothing to alleviate the bottleneck caused by the low-speed modem link. Connecting a 1M, 4M or 10M bit/sec local network to a 1,200 bit/sec modem restricts the use of dial-in to electronic mail and remote file management.

File transfers, file access and printing can be accomplished only with a great deal of patience. During long transmission periods, error rates on phone circuits are often noticeable. Dial-in software vendors

have begun addressing these problems with background operations, data compression and error-correcting protocols.

Some vendors have begun integrating local-area network modem software with hardware and directly connecting the resulting modem server to the network.

For example, Shiva Corp.'s NetModem attaches directly to an Apple LocalTalk local net and supports both dial-out and dial-in. NetModem includes such local net-specific features as workstation display of modem status, queuing of user requests and user notification of incoming calls and modem availability.

■ **Facsimile.** Over the past year, facsimile machines have been incorporated into personal computers as add-on boards.

Some personal computer facsimile board vendors have added the appropriate

software to allow their boards to be shared by other users on the local net. Most of these products involve both workstation software and "server" software, in which the server is the personal computer with the facsimile boards installed. The workstation facsimile software communicates with the server over the local net via an API such as NETBIOS.

With such software, users can send image files to the facsimile server for transmission over telephone lines to another facsimile or facsimile server. Users do not have to create a hard copy of their document; nor do they have to walk to the facsimile server itself. They can send any document stored in bit-mapped format, including text files, graphics and any images scanned into disk files. Many personal computer applications allow files to be

converted to bit-mapped images.

Some of the local net facsimile systems available today include conversion software for translating files from several leading word processing and graphics applications to bit-mapped images. Once converted, image files can then be queued for output over the facsimile link. Many of the local net facsimile server products offer queues to which users submit a file and a telephone number of the facsimile machine to which the file is to be sent.

Another capability several local-area network facsimile vendors offer is the ability for users to receive incoming facsimiles over the net in electronic form. Received files can be printed immediately onto paper. Or the bit-mapped image file can be sent over the net to a workstation, where the user can store it, print it or use it in other documents. Note that conversion from bit-mapped images into other document formats is a difficult and usually unavailable option using current technology.

An example of a local net facsimile product that is well-integrated with local net operating systems (at least with 3Com's 3+ Mail) is Faxway from Compfax Software International, Inc.

Faxway actually translates 3+ Mail messages and certain kinds of attached files into bit-mapped images for facsimile transmission. Faxway generates its own cover sheet, allows users to multicast transmissions to multiple destinations and uses the 3+ directories so that users can specify logical names rather than be required to remember facsimile phone numbers. In future versions, Compfax plans to add receive capabilities and to integrate Faxway with Novell's NetWare, Banyan Systems, Inc.'s VINES and PCC Systems' cc:Mail.

■ **Tape drive backup.** Magnetic tape drives have long been popular as backup devices for stand-alone personal computers with large hard disks. Tape backup has become a popular means of protecting local net file servers, which generally use larger hard disk drives than the average local net workstation.

Most of today's tape backup systems still operate in single-user, single-machine mode. A local net administrator must perform the backup by running the tape backup vendor's software while sitting at the server with the tape drive locally attached. Local net user files are backed up if the files are located on the server.

Some tape backup manufacturers have added more sophisticated local network capabilities to their systems. For example, Emerald Systems Corp.'s Tape Backup Server allows all local net users with the appropriate software running on their workstation to back up their locally stored files. Thus, backup capability is distributed and shared, while backup facilities and storage are centralized.

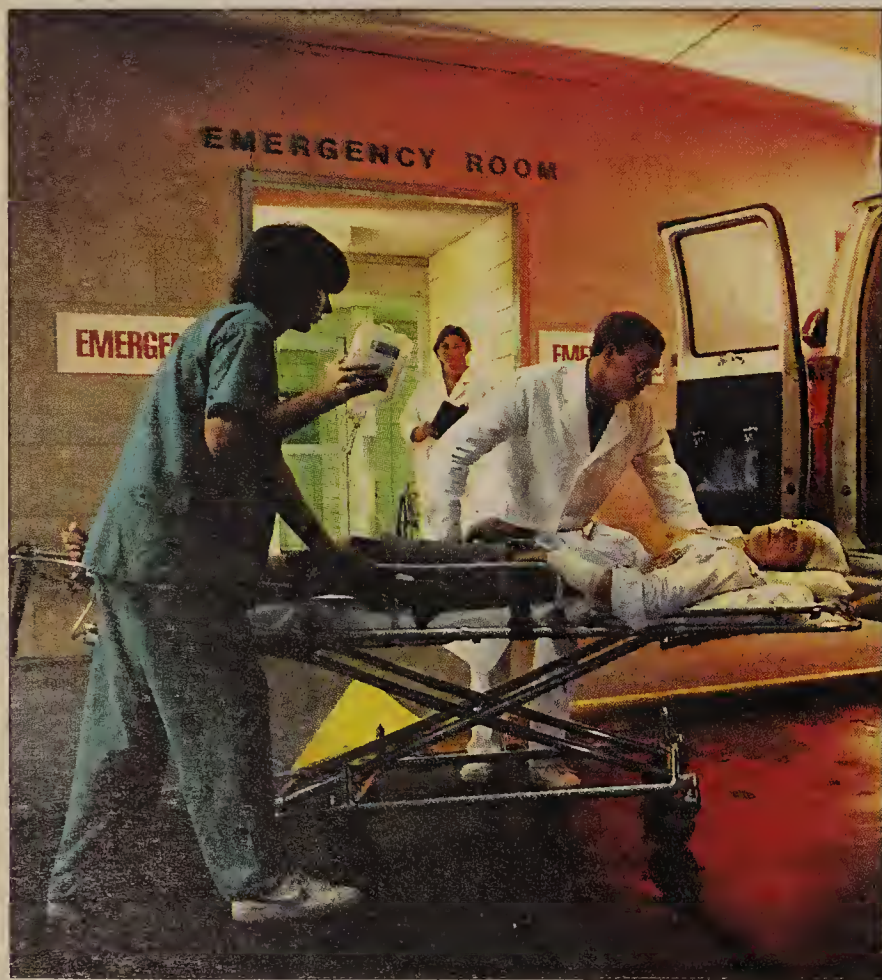
Users can also direct the backup and restoration of server-based files without having to actually go to the server. Emerald Systems has integrated its tape backup software with NetWare, enabling its software to use NetWare security to limit user abilities to back up and restore files. It also allows the Tape Backup Server to locate and copy "hidden" NetWare management files.

Like other sophisticated local net tape backup products, the Tape Backup Server can queue backup and restore requests from multiple workstations and servers and distribute these requests to multiple distributed tape drives.

Other features of the latest local net  
(continued on page 49)

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# If service be the food of LANs

By MIKE HURWICZ

**L**ike growing children, burgeoning corporate local-area networks have big appetites — not just for hardware and software but also for support services. While vendors such as Novell, Inc., 3Com Corp., IBM and Banyan Systems, Inc. have improved their support capabilities in recent years, they nevertheless fall far short of satisfying users' craving for support. End-user companies have, therefore, become adept at "home cooking," or providing their own in-house support. Large customers, however, may persuade the vendor to provide a network technician who is paid by the vendor but works full-time at the customer's premises.

Even these arrangements don't necessarily provide the wide variety of support services that large customers need. For this reason, many other firms, including Big Eight accounting firms, systems integrators, value-added resellers, distributors and dealers, have stepped in to fill the gaps. However, as local net vendors continue to improve their support capabilities, the long-term trend may be a return to increased support from vendors.

## The pounding pace

As the local-area network market continues to grow at a breakneck pace, the demand for

*Hurwicz is a free-lance writer and local-area network consultant based in Nashville.*

technically competent local net technicians grows with it. This makes it difficult to find, hire, train and keep technicians.

"Vendors are faced with a lot of turnover of their technical support staff," says Jeff Kaplan, director of networks and professional services at The Ledge-way Group, Inc., a Lexington, Mass.-based consulting and market research group specializing in customer service and support issues. Because of this, Kaplan says, local net vendors have not been able to satisfy their customers' needs for support.

"Vendor support is improving considerably," Kaplan notes. "But they're playing a catch-up game. The quality of service improves daily, but the demands on that service capability are multiplying far more rapidly. Vendors can't keep up with it."

## A real pain

"Vendor support can be a real pain," concurs Cheryl Currid, manager of applied information technology for Coca-Cola Co. Foods Division in Houston. Currid, who manages 15 local nets at the corporate offices as well as others in regional offices and plants, says she has been especially disappointed with application software companies' support people who don't know how their own applications run on a network. "There have been a number of occasions when we have shown vendors how to run their own software," Currid says.

Despite such complaints,



there is a widespread perception that vendor support is improving. Local-area network managers at large companies often feel especially well off: They say vendors give them special consideration

because of their size.

Currid says that Novell's support people amaze her. "NetWare's so complex. They have difficulty with it, but they do a

*(continued on page 46)*

As installations get larger and more complex, LAN users are hungrier for service and support.



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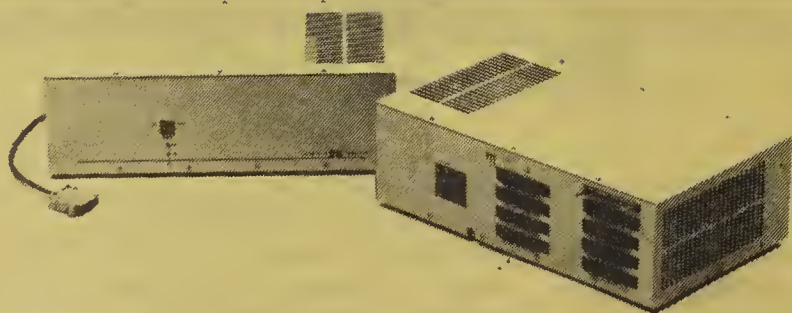
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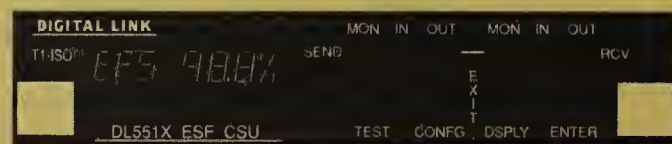
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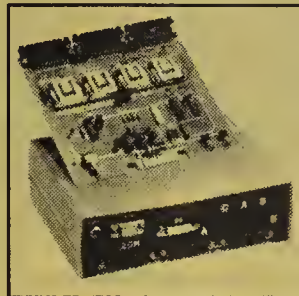


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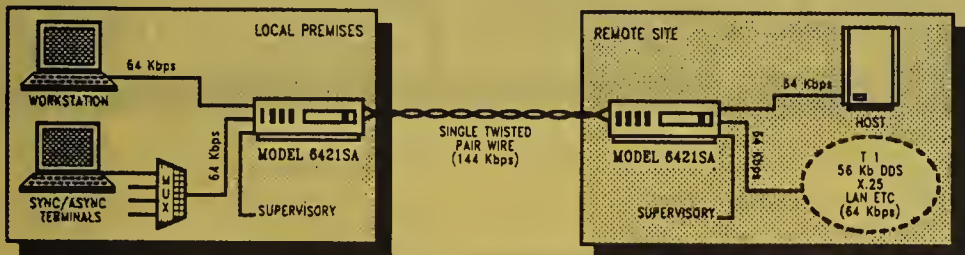
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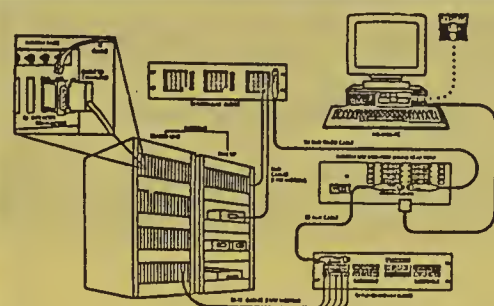
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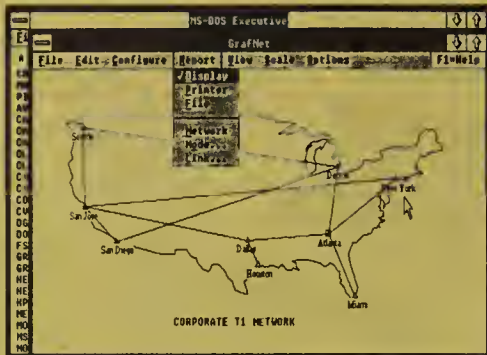
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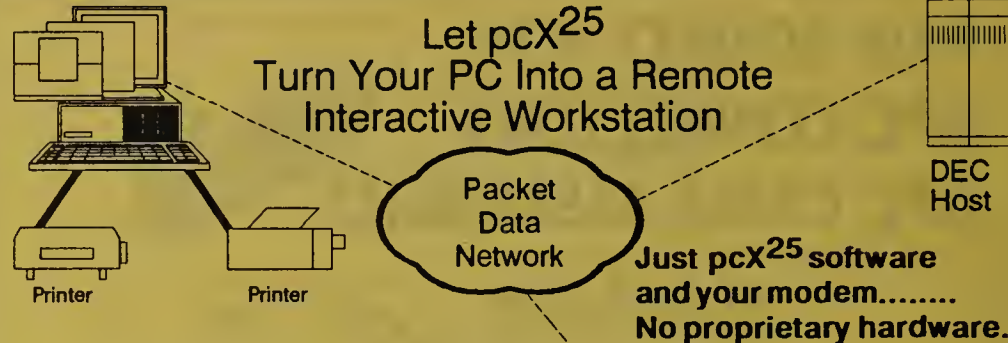
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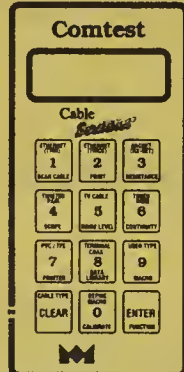
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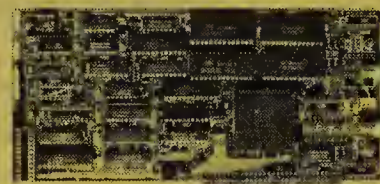
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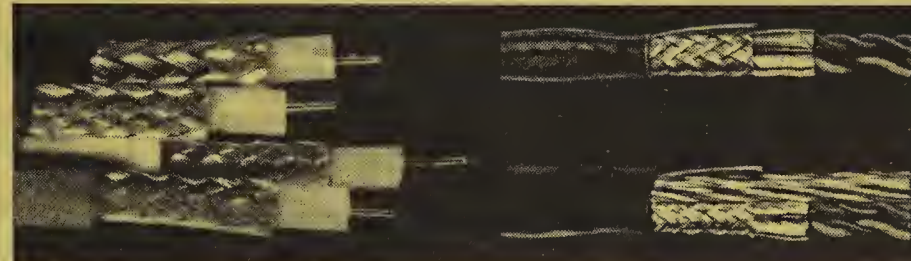
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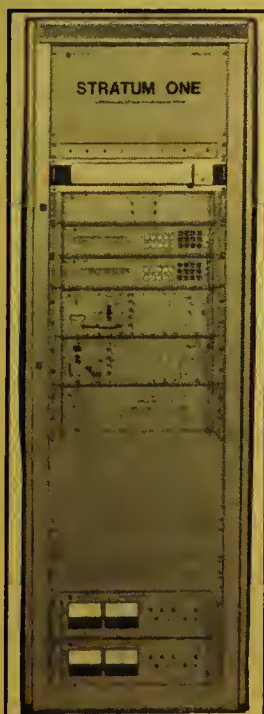


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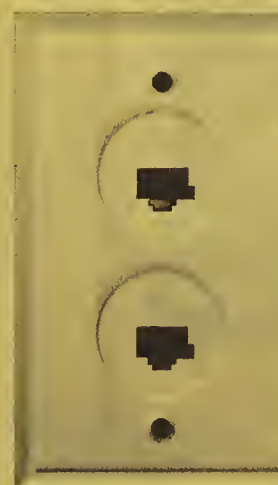
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Mar. 20 - LAN Management Update: LAN Peripherals

Mar. 27 - Datacom Management Update: DEC

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May 15 - LAN Management Update: (TBA)

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Apr. 10 - LAN Buyer's Guide: LAN Analyzers/Managers  
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Apr. 17 - Telecom Buyer's Guide: DDS & T-Carrier Test Equipment

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Aug. 7 - Datacom Buyer's Guide: Gateways, Routers & Brouters

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Sept. 11 - LAN Buyer's Guide: LAN Operating Systems

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### Industry Focuses:

Apr. 24 - Media (Broadcasters, Publishers & On-line Info Providers)

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## If service be the food of LANs

continued from page 39

good job," considering the many types of hardware it runs on. She also notes that "the problem [of incompetent application vendors] has improved since last year."

Rick Segal, a technical adviser in the Commercial Insurance Division of Aetna Life & Casualty Co. in Hartford, Conn., agrees that "Novell has made tremendous strides [in providing support]." He also compliments Borland International, Inc., Microsoft Corp. and WordPerfect Corp. "They are all excellent, and they don't care whether you are an end user or a big corporation."

In general, Segal notes, he is satisfied with vendor support for local networks.

"During all my years at Aetna, I don't think I have ever run across a vendor that hasn't supported Aetna in the style I wish I could get as an end user," Segal says. "Vendors stand up and take notice when we say we're calling from Aetna."

For example, he says, vendors may give Aetna support that is not generally available. This two-tier support syndrome is not uncommon and is understandable, though it can be unfair to smaller companies or individual users.

### Big problems call for vendor aid

John Cornell, a network specialist at Pacific Gas & Electric Co.'s Diablo Canyon power plant in San Luis Obispo, Calif., says his company provides most of its own support, but "for complex problems with VINES, we go straight to Banyan. We have a support contract with Banyan, and [although] we have some problems with their support, we have it better than most companies since we are a very large customer." Pacific Gas & Electric has approximately 100 VINES servers and buys more from Banyan than any other single customer, according to Cornell.

Gary Hill, data communications network manager at Boeing Computer Services Co. in Seattle, which provides computer services to Boeing Aerospace Co., says he is pleased with vendor support for his Novell local nets because his primary support contact is a Novell employee who is at Boeing five days a week, eight hours a day.

Currently, Hill is in charge of 3,000 to 4,000 workstations and several hundred file servers. As the network continues to grow, he expects to add a second and eventually a third Novell support person on site.

Kaplan agrees that on-site vendor representatives are becoming more common in "high-end organizations," which are customers that buy a lot of the vendor's products.

He adds that such arrangements have been characteristic for other types of equipment, such as private branch exchanges. Such close customer-vendor ties are a sign of a maturing industry, he says. In addition to Novell, 3Com Corp. and IBM also place support people on site.

### An hors d'oeuvre and a side dish

However, a vendor representative on site and a special phone number are still only an hors d'oeuvre and a side dish in the full-course meal that constitutes a large company's support needs. In fact, large users may be satisfied with minimal vendor support because they have come to expect little from their vendors. Vendors have encouraged this by passing the buck to distributors, dealers and, ultimately, to the

end users themselves.

To resolve the problem of too many support demands and too few technicians, vendors may force distributors to shoulder

ers to be more self-sufficient.

For instance, Novell typically no longer supports end users or dealers directly. Instead, Novell's distributors have to provide

has improved significantly due to the new policy.

### Off-loading support

Banyan also off-loads support to its resellers. Ruff, who resells VINES, says Banyan has had an easier time with support due to its smaller volume of business. VINES also constitutes only a small part of Net-Tech's business compared with NetWare, Ruff says. Banyan requires Net-Tech to buy a support agreement costing between \$400 and \$2,000 for each VINES network it sells. Then, if a customer has a problem, Net-Tech relays the query to Banyan, along with the service contract number.

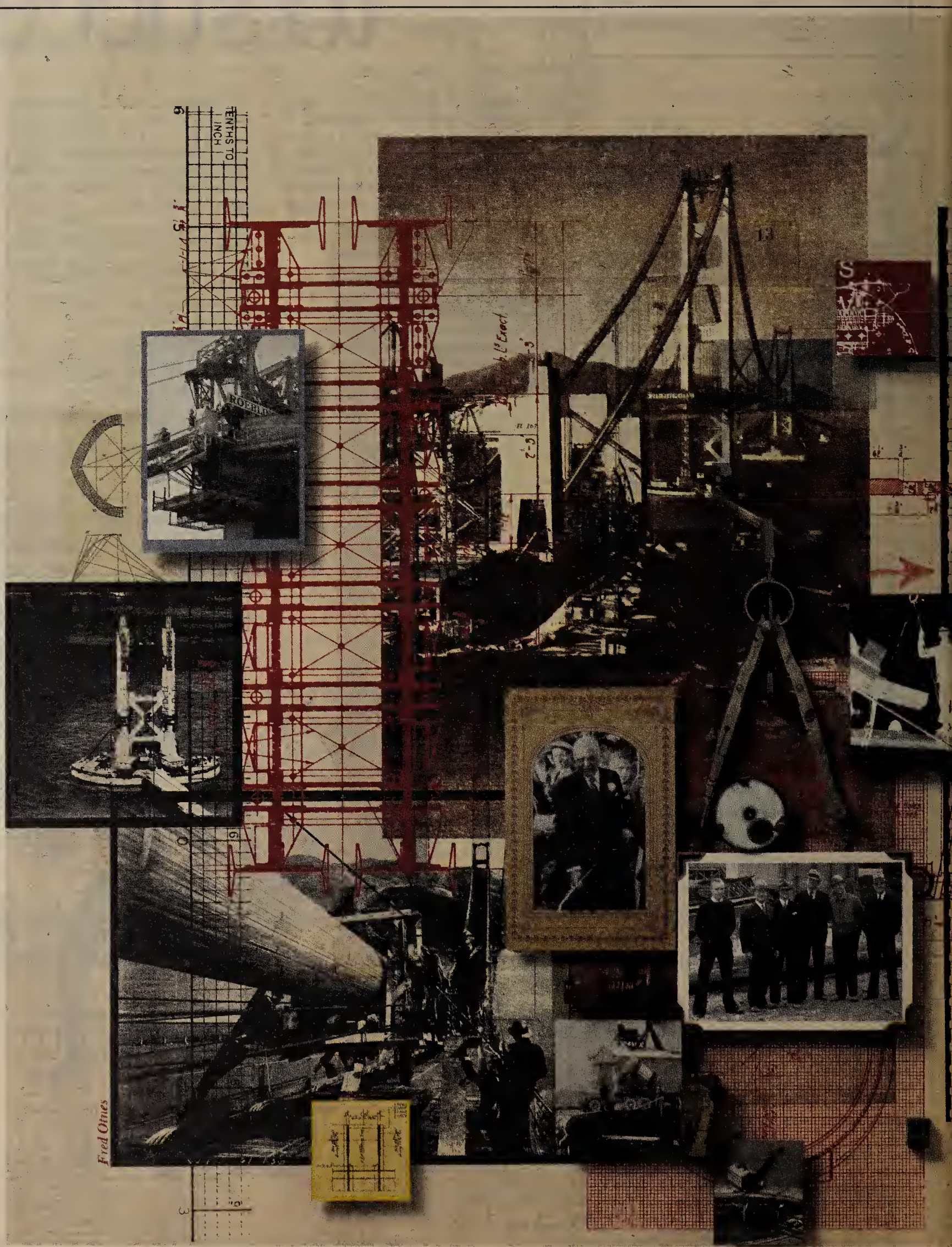
3Com generally expects dealers and distributors to provide support, according to Bob Buchanon, a manager in 3Com's

**"V**endors stand up and take notice when we say we're calling from Aetna," Segal says.



more of the support burden. Distributors often attempt to pass responsibility on to dealers, systems integrators and value-added resellers that, in turn, encourage us-

support to their customers. According to Mike Ruff, president of Net-Tech, Inc., a Norcross, Ga.-based systems integrator, Novell's ability to respond to support calls





software product marketing group.

"Resellers are required to have full service and support organizations as part of being able to sell our products. We have terminated resellers because of not providing enough support to customers," Buchanan says.

However, customers can buy support contracts directly from 3Com or turn to third parties for support, he says, adding, "Some customers that are larger or have their own in-house technical support group may feel [better] going directly to 3Com. Some of them have several employees who have gone through all our training classes."

#### Unqualified resellers

While relying on resellers for support

many resellers don't have the technical expertise to solve the types of problems that afflict large users.

Boeing's Hill says that, until about two

to handle a lot of the problems that came up in Boeing's large and complex network.

The reseller had to call 3Com's technical support engineers, which resulted in

**“When you have a production problem, you need an answer right away,” Hill says.**

▲▲▲

years ago, Boeing depended on a local value-added reseller for support of its 3Com local-area networks. Unfortunately, the reseller didn't have the technical expertise

delays and, sometimes, miscommunication. This posed severe problems for Boeing. "When you have a production problem that affects a couple of hundred

people on a LAN, you need an answer [right away]," says Hill. "You can't wait for days at a time."

This experience prompted Boeing to request a Novell technician on site before deciding to standardize on NetWare.

Craig Lessard, a network analyst with the Board of County Commissioners in West Palm Beach, Fla., says he relies primarily on his own MIS department to do any troubleshooting and diagnostic work required on the board's 11 networks, nine of which are 3Com 3+Share and two of which are Novell.

While Lessard says he is "very satisfied" with the reseller that currently supports his networks, he says that "With previous purchases from other vendors that were generally in the market of selling PCs, that wasn't the case. They didn't seem to have the networking expertise to answer questions over the phone or get the quality response time that we needed."

#### Flunking vendors

"Our problems are technically complex," says Coca-Cola Foods' Currid. "We tend to [flunk] a lot of vendors, [value-added resellers], contractors and consultants because of all the connectivity options we have installed."

"I deal with networks day in and day out," says Greg Scott, computing services manager for the College of Business at Oregon State University in Corvallis. Scott is responsible for seven NetWare servers and 245 workstations. "Most distributors, even the ones that handle networks very intensively, have difficulty staying current with the technology. They are too busy trying to make a buck. I'm often answering their questions, rather than the other way around."

Art Berger, an account dealer manager for Microserv Technologies Corp., a Milford, Mass.-based distributor, notes that, while a computer store may have one person who understands networks, "The average retail person sells the network as a concept but doesn't really understand what he is selling. So, end users don't really understand what they are getting into, and the retailer is not in a position to train the end user. Then support becomes a major problem, [and] they're coming to us to try to get the users and the administrators up to speed."

Even systems integrators, which specialize in multivendor networking, have problems maintaining support teams that can handle the complexities of large local networks. "A systems integrator has to support so many kinds of equipment," Ruff says, "that all technicians cannot be expert in all systems." Each technician has to specialize in certain types of equipment, but then "nobody understands the whole thing," Ruff says.

His solution is to appoint the highest level technician on a difficult project as project manager. The high-level technician can call in any help needed from the Net-Tech staff or from outside sources.

#### Let's have a (third) party

Another answer to users' support needs is to turn to third parties that specialize in support. This option may be particularly attractive to large companies that have sites in many cities and want to get local support at each site through a single support organization. Such firms can turn to a third-party maintenance organization with offices close to all relevant sites. The third party provides all locations with a consistent level of service and permits the

(continued on page 48)

## “MAN RUNS. NATURE STROLLS. HERE IS A BRIDGE FOR BOTH...”

*Reported observation at the dedication ceremonies of the Golden Gate Bridge, May 28, 1937.*

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(continued from page 47)

customer to deal with just one service provider nationwide or worldwide.

For instance, Rusty Druba, supervisor of workstation services at Chevron Oil Corp. in San Ramone, Calif., says Chevron has a contract with GE Computer Services of Atlanta to maintain its personal computers, terminals and small printers. "Our help desk does the preliminary diagnosis," he says. "It dispatches a trouble report to GE, which comes on site, fixes it and clears the trouble ticket with the help desk."

"This is an indication of where the world is going," notes The Ledgeway Group's Kaplan. "Vendors don't have the support staff to keep up with the demand, so they must form strategic alliances with third parties."

#### Another support avenue

In February, both 3Com and Novell announced certification of third-party maintenance providers. Hewlett-Packard Co. will handle support for 3Com worldwide. "It's one more avenue for customers to look into," says 3Com's Buchanon. "They can get support through us, through resellers and now through an approved third party."

Novell has approved four third parties to provide support for NetWare local nets: HP, Xerox Corp., BancTec, Inc. of Dallas and Federal Technology Corp. of Washington, D.C. The support includes microcomputer hardware platforms that Novell does not supply. BancTec and Federal Technology have had agreements with Novell for some time, according to Mike Sikalis, vice-president of Novell's Services Division. In addition, Sikalis says, technician certification require-

becoming more experienced and competent with local-area networks. Many have been working with local nets for years now. In addition, they are more familiar with the details of their networks, which typically consist of hardware and software from several

to hire new support people.

The desire for in-house support is especially strong in larger firms, Microserv's Berger says. "More of them are sending their people in for training so they are a lot more self-reliant. They're not relying as much on the manu-

**N**et-Tech's Ruff found that customers must be at least 80% self-sufficient in order to be satisfied that their networks are working correctly.

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different sources, than any single vendor, distributor or dealer could be. The user may also be the one that best understands how the pieces fit together.

"Customers found that they were forced to train the vendor staff in many cases," Kaplan says. "The vendor staff didn't know their own equipment or the equipment of other vendors. They didn't know the user's site, operating requirements or business applications, either. To get the job done effectively, companies had to turn inward."

Resellers have supported this move because it results in more satisfied customers. "We would like to make end users as close to self-sufficient as we can," Net-Tech's Ruff says. He has found that customers must be at least 80% self-sufficient in order to be satisfied that their networks are working correctly. Otherwise, he says, everyday problems will incapacitate them, and they will consider the network a failure.

facturers, or on their retail people, as they did in the past." As a distributor, Microserv cannot sell training to end users. Instead, it sells to consultants or resellers, which resell to end users.

#### Hierarchical support

Even within end-user organizations, there is a tendency to build hierarchical support systems. For instance, Chau Yoder, network operations manager at Chevron Information Technology Co. in San Ramone, Calif., says that each users group typically has a site administrator who provides first-level support for its local networks. For those local nets supported by the central support group, second-level support problems are handled by the central group rather than the site administrator.

Similarly, Bonnie Beckham, a network systems administrator at Brown University in Providence, R.I., says that users with questions or problems turn first to a "subnet coordinator," who has primary responsibility for a particular departmental local net or subnet.

The subnet coordinator also handles software and hardware upgrades, system documentation and data backup. In addition, the Computing and Information Services department provides support in the form of consulting, training, troubleshooting and repair.

#### Preventive medicine

Self-reliance, supplemented by a support contract, can lead to a more preventive attitude toward support, according to Ruff. He says that a Net-Tech technician routinely stops by each customer's site to make recommendations and solve particular problems. In this way, difficulties are addressed before they turn into emergencies, Ruff says. It also makes things easier on Net-Tech because the technician can schedule visits so that travel time is minimized.

"We don't [want to] have to make an appearance in Birmingham today, Atlanta tomorrow and then Birmingham again the

day after tomorrow," Ruff says.

In the future, Ruff predicts, "support and service are going to be more like a health maintenance organization than an emergency room."

The move toward self-reliance will continue for the next four years, according to Kaplan. Surveys conducted by The Ledgeway Group indicate that while overall support costs for both local- and wide-area networks will grow at an 8.8% annual compound rate from 1988 to 1992 (from \$3.1 billion to \$4.2 billion), customer self-service will grow at a rate of 11.3% during the corresponding period (from \$1.2 billion to \$1.7 billion).

However, Kaplan does expect the balance to tip back toward vendors as time goes on. He expects that companies will have made the investment in support up front so they will not have to bring staff aboard so rapidly during the coming years. Vendors, on the other hand, have made less of an investment and will be catching up in the years to come. As a result, vendor support will become an increasingly viable option, Kaplan says.

#### A little help from friends

Even companies that are largely self-reliant do need a lit-

ered during the design phase. A consultant or contractor may have that experience.

"During our original design and implementation, we did bring in consultants," says Pacific Gas & Electric's Cornell.

A 1987 survey by The Ledgeway Group showed that of 181 users, 99 said that they had designed their own networks but would go to an outside source if they had it to do over again. This was by far the largest "remorse" category. Backup technical support ran a distant second, with 24 people expressing remorse for taking on that job themselves.

#### Staying au courant

It is particularly important to get help with design when there is a change in the state of the art, Ruff says. But, as Berger points out, local-area network technology is changing constantly. "Novell has upgraded its product four times in the last year. Just about the time something is installed, it's getting upgraded again."

However, once a company has worked with a particular system for a period of time, in-house staff may be able to cope with upgrades as easily as a consultant. "We will sometimes bring someone in to look at our design and try to think of a better way of do-

**I**n the future, Ruff predicts, "support and service are going to be more like a health maintenance organization than an emergency room."

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**“V**endors don't have the support staff to keep up with the demand, so they must form strategic alliances with third parties,” Kaplan says.

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ments have been made more stringent.

Third-party maintenance can be a good solution in situations in which vendors and resellers can't cover the customer's far-flung sites. However, third-party maintenance can be expensive, and the faster the guaranteed response time, the higher the cost. To provide a quick response at a lower cost, users typically rely on in-house support teams.

#### Self-reliance

For many reasons, self-reliance makes sense for large customers, Kaplan says. Users are

However, Ruff notes, the typical customer doesn't achieve independence the day the network is installed. A small customer may depend heavily on Net-Tech for six months after installation. Very large customers may take two years to wean themselves from heavy dependence on the reseller.

Net-Tech asks that the customer's system administrator be present and help with every network upgrade, addition and modification. Through this process, the user organization develops the ability to support the local network in-house without having

tle extra help now and then. Contractors and consultants can provide that helping hand. Kaplan says that companies ranging from Big Eight accounting firms to smaller systems integration firms are hiring themselves out to help users design, troubleshoot and maintain networks.

#### We don't have an army

"We have in-house staff as a first line of defense," Currid says, "but we don't have an army. So, we make fairly heavy use of outside contractors and consultants. We've tried to develop an extended family — people who know the system and the environment, so they don't walk in cold. Some of these relationships are more successful than others."

In general, however, Currid says she wishes Coca-Cola Foods had more such relationships. Again, the appetite for competent support exceeds the supply.

One area in which outside consultants may be particularly useful is that of network design. It is quite likely that the customer will not have experience with all the equipment that must be consid-

ing something," Currid says. "But we are to the point where our internal staff is so good at that, we are relying less and less on consultants."

However, she adds, "You don't want to get so cocky that you think you know everything. That's where you really get in trouble. I like to bring in outside people to see if they can't see a better way."

Cornell says, "After [original design and implementation], it's been basically all in-house. We do most of our own support because we have a highly technical staff."

Growing local networks demand increasing amounts of support. Vendors are getting better at providing that support and may one day make a comeback in the support arena.

For the moment, users are getting their support where they can. Resellers, consultants and third parties all have an important role to play. However, in-house support staffs still bear the brunt of the load because they are often the only reliable way to get the quick response needed when local net problems arise. ■



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Many systems can selectively back up based on file name, user or date last modified. Partial, incremental and selective backups are important capabilities of local net tape backup systems because of the traffic load that centralized backup can put on the network.

Local-area network servers are extremely vulnerable to power problems since most local net operating systems keep their disk directories in RAM, where they can be lost in the event of a power failure. Since the file server is usually the most active component in a local net environment, it makes sense to protect the server before the workstations. Yet users cannot continue working during a power failure if only the server is operational.

A current debate in the industry is whether to use a central or distributed uninterruptible power supply system to support distributed local net resources.

Distributed uninterruptible power supply systems require numerous smaller devices that service one or more local resources and use a local outlet for normal power draw.

Users then have plenty of time to finish their work sessions before battery exhaustion occurs (the battery reserves often last four hours or more). The uninterruptible power supply-monitoring software can be configured to automatically start closing server files and saving directories to disk.

## What the future holds

sions of their products. Local net operating system vendors, in the meantime, are carefully picking and choosing those peripherals, such as tape drive backups, that they can resell or manufacture themselves for substantial profit.

Large system vendors, such as IBM and Digital Equipment Corp., realize that they already have high-speed, multiuser peripherals. By integrating their host processing with personal computers and having minicomputers and mainframes act as local net servers, these vendors hope to bring their host printers, disk drives and backup systems into the local net peripheral market.

Certain peripherals, such as facsimiles, will become extremely popular and develop fully into separate local net servers. Others, such as uninterruptible power sup-

plies, will likely remain local net peripherals. Overall, the need to share peripherals will increase as local net applications and the number of users increase.

Diskless workstations will also increase demand for shared peripherals as their minimized configuration increases their reliance on network devices. Future capabilities of the more sophisticated local network peripherals include integrated local-area network management features such as remote diagnosis and configuration as well as reporting.

When evaluating such peripherals, local net buyers should consider the performance and capacity of the device with respect to total expected traffic load. An examination of the architecture used can reveal potential throughput bottlenecks and use of vendor-specific interfaces as

well as the potential for future integration with local net operating systems and ability to function as a server.

Buyers should also look at the workstation interface: What functions are available to the local-area network user? Is the user interface integrated with the local net operating system's menus? What user applications can access the peripheral?

Finally, management of the peripheral should be considered: Can it be remotely monitored, diagnosed and configured? How can the local net administrator control access to the device?

The ongoing evolution of local-area network peripherals from personal computer devices to local net servers results in the familiar trade-off of meeting a current requirement or waiting for more sophisticated products. **□**

## A cartoon illustration of a man in a suit standing in a doorway, looking into an office. The office contains a desk with a lamp, a telephone, and a wastebasket. The man is holding a briefcase and looking at his watch.

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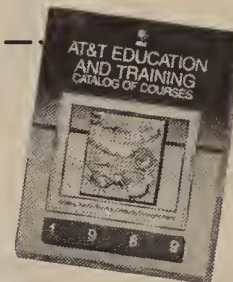
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## Letters

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no competition, we would still be communicating through step-by-step telephone switches.

These companies have reacted to market share loss and have reached into their research and development budgets to become competitive.

End users also feel that a commitment to a single-vendor procurement strategy puts them in the position of being a hostage to one particular vendor.

The major players, from time to time, have been more than willing to hold an end user who pursued a single-vendor procurement strategy hostage to their needs.

Orwick discusses the impact of users groups in his letter. In my experience, the

only clout a users group has with the vendor is the implied threat of no longer needing to belong to that users group.

I have been in the information management and movement business for 25 years. Since 1975, one of the first questions I generally ask of a potential client has been: "Are you a single-vendor shop?" Only two end users have ever answered yes to that question, and only one of them was planning to stay that way.

Orwick suggests that the end user who becomes dissatisfied with his single vendor could migrate to another vendor.

This migration is already happening. The end-user population is rapidly moving from a mainframe-based computing environment to a distributed, multitiered computing environment.

I believe this trend is a result of end-

user dissatisfaction with single-vendor procurement strategies and the technology brought to the table by competitive enterprises.

In summary, the complexity of dealing with multiple vendors is a small price to pay for the freedom to choose the best available technology, and besides that, it's fun.

Richard Boas  
Principal consultant  
WJP Associates  
Buffalo, N.Y.

### Advanced degree options

I am writing to commend your attention to advanced degrees in communications management, signified by your feature article, "Advanced degrees can speed career success" (NW, Jan. 9). But I must

object to a serious oversight: In your chart, you neglected to include the Annenberg School of Communications at the University of Southern California.

Annenberg's master of arts in communications management, a program that enrolls approximately 170 students a year, has been awarded since 1975.

The degree takes many graduates into telecommunications careers — managing voice and data systems for firms, conducting market and operations research, directing strategic planning for common carriers, working in service development or sales, analyzing issues in telecommunications law and public policy, and more.

The two Annenberg Schools — at the University of Southern California (USC) and the University of Pennsylvania — are quite different in their orientations.

The curriculum at Annenberg at USC presents a broad spectrum of courses aimed at professional practice and offered by full-time faculty members.

Annenberg students have access to USC's entire graduate curriculum in addition to courses at the Annenberg School. Also, the school's full-time career development office helps place graduates and provides support that enables students to work while completing studies.

I hope this helps acquaint you with the academic options that are available at the Annenberg School.

Peter Clarke  
Dean  
The Annenberg School  
of Communications  
Los Angeles

Nik Morley's recent article on advanced degrees in telecommunications provided an interesting discussion on the value of pursuing further education in this field.

Of particular interest to me as dean of a graduate school offering a master of science in telecommunications management were the remarks concerning the need for combining a generalist business and management emphasis with a technical education. One-sided programs stressing the strictly technical or training aspect of education in telecommunications simply cannot provide the student with the practical tools necessary to perform or manage in the workplace.

Recognizing this fact, our master's degree in telecommunications management at the Graduate School of the University of Maryland University College focuses on critical management concepts while at the same time providing the technical and practical knowledge relevant to the successful operation of all voice and data communications.

Adding to the popularity and industry support of this degree is the hands-on telecommunications laboratory, which is nearing the end of construction. Our research shows that this laboratory, which will include state-of-the-art digital and packet switches, local-area networks, workstations and other specialized hardware and software, will be unique.

Although our graduate program was inadvertently left off your survey, I hope readers of *Network World* will consider the University of Maryland University College's master's in telecommunications management program as well as those institutions listed in your article when pursuing a degree or certificate in this field.

Milton Grodsky  
Dean of Graduate Studies  
and Research  
University of Maryland  
College Park, Md.

John Gallant, editor, *Network World*

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## Users move toward integrated net mgmt.

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ers experience in the mainframe world.

While some vendors hope to develop a single network management system to probe everything from the desktop workstation to the satellite, Spanier envisions a hierarchical net control scheme whereby individual network management systems will be coordinated by a single authority.

"It's a question of how to get a lot of independent management systems to communicate with one another," Spanier said. "We will see a mad rush by virtually every systems and networking company — both LAN and WAN — toward an integrated network management scheme."

It will no longer be enough for a local

network vendor to provide network management capabilities for just its own products. Novell, for example, will have to let NetWare local networks be managed in an integrated fashion as part of a larger networking environment, Spanier said.

At its annual developers' conference in February 1988, Novell published application program interfaces (API) for its NetWare server and workstation shell software. Novell and a number of third parties have already used these APIs to develop net management software for NetWare.

### Standards adoption

If the management systems of NetWare and other local networks are to interoperate in the type of hierarchical, corporate-wide scheme Spanier envisions, some standards will have to be adopted by ven-

dors. Likely candidates include IBM's NetView and the Open Systems Interconnection Common Management Information Protocol (CMIP) that has been endorsed by Digital Equipment Corp., Hewlett-Packard Co. and 3Com. CMIP proposes to use the OSI transport protocols to route net control data among different vendors' systems.

The CMIP standard, however, is still evolving and without many OSI applications, has little immediate value. Consequently, some vendors, such as 3Com, have embraced CMIP Over TCP (CMOT), which uses the Transmission Control Protocol/Internet Protocol to route net management data among different networks and shares the same application interface as CMIP.

CMIP will depose CMOT when OSI has

gained enough market momentum to surpass TCP/IP, but any applications written to the common interface won't recognize the difference. Thus net managers can develop network management systems today and know they will survive the transition to OSI, Benhamou said.

Spanier said he is encouraged that user cries for integrated network management capabilities have not been in vain.

"Over the next year or two, we will see new products with some degree of network management integration, which will show the user community that vendors have indeed been listening," Spanier said. "With everybody turning their attention to standards, and with the standards solidifying during this period of time, hopefully everybody's network management solutions will end up interoperating." □

## Coping with today's information anxiety

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colorful, easy-to-read travel guides.

Some of the best information in this book concerns how to put complex data into an easily digestible format. Wurman stresses the need for technical professionals to avoid the "disease of familiarity," when a manager becomes so comfortable with a subject that he forgets what it means to not understand it. This limits his ability to explain things to the uninitiated, as well as his power to persuade and inform.

Wurman exhorts people to translate difficult ideas into everyday concepts. For example, saying that one acre spans about a football field minus the end zones is more informative than saying it is 43,560 square feet. Communications managers could become more informative by applying this approach in their own job. They could tell senior managers, for instance,

It's better to know how to access than how to memorize.

▲▲▲

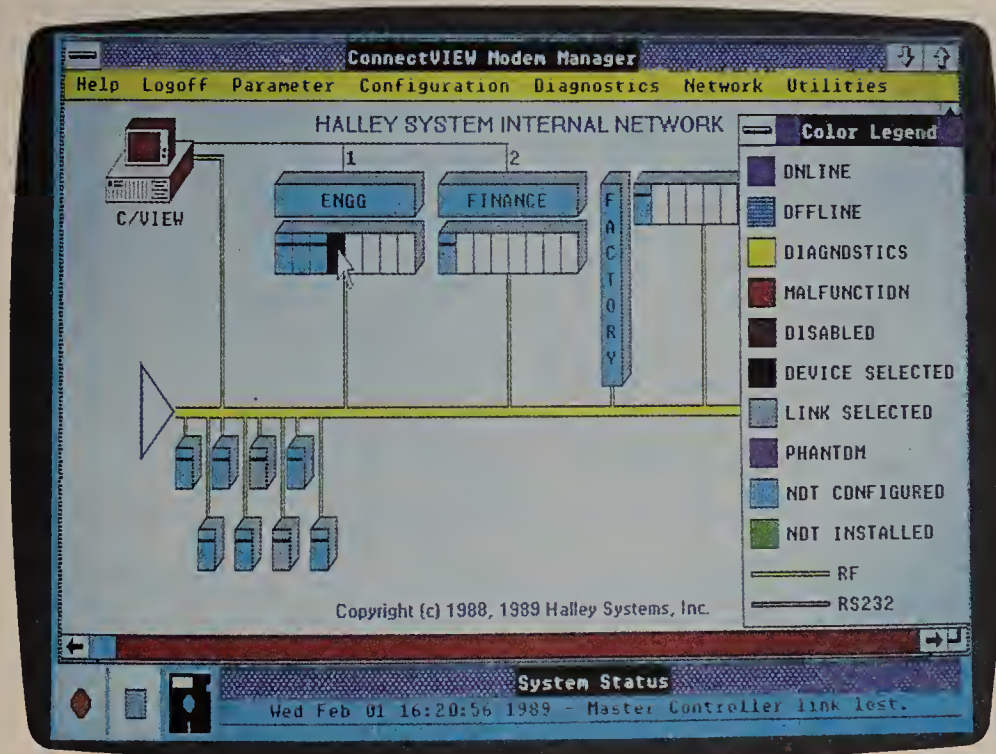
that a T-3 line can transmit approximately one set of the *Encyclopedia Britannica* every minute, rather than 45M bit/sec.

Wurman also offers advice for busy professionals on how to cope with the increasing amount of information that crosses their desks. The key, he says, is to put oneself on an information diet. Communications managers, who are continually pressed to keep up with rapidly changing technology, should limit their daily information intake, concentrating only on those things that are most salient. In most cases, it's better to know how to access, rather than how to memorize, information that might be needed on the job.

*Information Anxiety* is filled with anecdotes and examples that effectively illustrate the points Wurman argues, and they make reading the book worthwhile. Wurman perhaps goes a little far in devoting about a quarter of each page to illustrations and blurbs, a practice I found distracting.

Also, the book has no index but rather, an extended table of contents, which made it hard to look up citations. All told, however, *Information Anxiety* is a helpful treatise on an important area for every communications manager. □

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## Developers dump hosts

continued from page 1  
which they can download information to local networks of personal computers.

"A LAN is analogous to the mainframe because you have common access, but it's better because each programmer has a dedicated CPU," said Kevin Hansen, a partner in NORCOM, a soft-

ware firm in Juneau, Alaska. "On a mainframe, when a group of programmers is doing on-line development, one guy can crash the whole system."

NORCOM sells microcomputer-based COBOL development tools. One of its primary customers is the state of Alaska. The company uses a remote Systems Network Architecture gateway to access a state mainframe and download a COBOL program to

NORCOM's Novell, Inc. NetWare local net. That net supports programmers' personal computers.

NORCOM started providing personal computer-based services about four years ago.

"At first, we couldn't believe it was possible to do COBOL programming on a PC, but then we discovered the Realia [Inc. of Chicago] COBOL compiler," Hansen said. "Mainframe compilers take seven to 15 minutes, vs. 30 sec-

onds on a PC, so the number of turnarounds you can do in a day is considerably higher."

But that was only the beginning. When NORCOM adapted its development tools to the NetWare environment a couple of years ago, programmer productivity was increased by a factor of 10, Hansen said. The network facilitated the coordination of individual development efforts.

The migration of software de-

velopment from hosts to stand-alone microcomputers was spurred by the emergence in the mid-1980s of computer-aided software engineering (CASE) tools. Among other things, CASE tools automate structuring techniques and the creation of data flow diagrams that were once done using templates, pencil and paper.

Because of the graphics limitations of dumb terminals, CASE tools appeared originally on microcomputers. This increased the value of the microcomputer as a development tool, and companies such as Nova Biomedical started moving some of their programmers over to microcomputer platforms.

There hasn't exactly been a stampede to microcomputer-based CASE tools, though. For one thing, the CASE tools tend to be pricey, costing \$5,000 to \$10,000 per user, and they frequently run only on expensive graphics workstations. Also, local net-based versions are few and far between.

"Most CASE tools available today are single-user repository systems," said Eric Goldman, president of DEFT, Inc., a Toronto-based software company that develops CASE tools that work with a variety of relational database management systems, including Relational Technology, Inc.'s INGRES.

When many programmers are working on the same design project, they need to combine their results. Goldman said a lot of the stand-alone CASE products, including DEFT's, have some type of merge capability that helps to accomplish this. However, Goldman agreed that a multiuser version running across a network of personal computers "makes eminent sense." He added that DEFT will begin beta-testing such a product in June.

DEFT's products use Apple Computer, Inc.'s Macintosh as a front end for developing applications that run on a minicomputer or mainframe. The Macintosh is employed to analyze user requirements and to design the software. The actual code generation is done on the target host.

Nestle Enterprises Ltd. in Toronto is using Macintoshes, Ethernet links and DEFT software to build applications for Digital Equipment Corp. VAX hosts running INGRES. The applications range from manufacturing and inventory control to sales reporting and personnel management.

Michael Davidson, manager of systems development at Nestle, said he is eagerly awaiting the multiuser version of DEFT. "The biggest problem with most CASE tools is that there is no multiuser support for large-scale projects. You need a common data dictionary."

One of the first firms to provide such a capability is Visible Systems Corp. of Waltham, Mass., which offered a NetWare version  
(continued on page 53)

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## FCC shakes off past, OKs caps for AT&T

continued from page 1

changes the FCC made were creation of a separate pricing category for residential services and the imposition of strict limits on price increases for residential night and weekend rates, as well as a limit on rate cuts — a so-called price floor.

Another significant change was the deferral of price caps for the local exchange carriers. Patrick continues to advocate price caps for local carriers, but he acknowledged that questions remain about consumer benefits.

Under the price cap plan approved last week, AT&T services will fall into three pricing categories: business, 800 and residential/small business services.

Services included in the business category include ProAmerica, WATS, Megacom, Software-Defined Network, voice-grade private lines, wideband private-line services (including T-1) and other switched services.

The residential/small business category includes Message Telephone Service (MTS), international MTS, Reach Out

"mystified" as to why the FCC is restricting its ability to lower prices when the FCC has stated that AT&T operates in a "ferociously competitive" long-distance market. "The basic concept of floors is inconsistent with the price cap plan," an AT&T spokeswoman said.

Patrick indicated that he was unhappy about the price floors but included them because of congressional concerns about predatory pricing. As a "philosophical matter, I have some hostility toward and resistance to floors," he said. "I don't want to see the regulatory process used to impede downward price movement that benefits consumers."

The International Communications Association (ICA) also criticized the price floors, saying they are not enough to protect business. Since the plan puts all types

of business services into the same basket, the price floors will not prevent AT&T from significantly raising the price of private lines while lowering switched service rates, said Brian Moir, an attorney for the ICA. The ICA maintains that AT&T's strategy is to migrate users away from high-capacity private-line services, which yield significant discounts for customers, to switched-based services.

Steve Kropper, a senior telecommunications analyst with International Data Corp., a Framingham, Mass.-based research firm, agreed that AT&T could use the plan to increase some service rates. Consumers can expect to see prices rise for any AT&T service that faces less than two competitors, he said. "We will clearly be moving toward subsidizing competitive services," he said. □

(continued from page 52)

of its 5-year-old Visible Analyst (VA) Workbench software at the recent NetWorld '89 Boston local net show. Another factor that makes Visible Systems stand out in the CASE market is its pricing.

"We chose VA because of its cost and features," said Nova Biomedical's Dalke. "When we bought our first stand-alone copy, it was \$600 or \$700. The closest thing to it at the time was in the \$10,000 range. VA got us 80% of what we needed."

Nova Biomedical makes blood analyzers for hospitals and clinics, and Dalke's group uses VA to develop real-time instrument control software for the equipment. Dalke said VA's ability to present data graphically and hierarchically is invaluable: "Like they say, 'A picture is worth a thousand words.'" □

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### Price cap time line

August '87	FCC proposes price cap plan.
October '87	About 80 groups file comments. Many are critical, saying FCC should explain more clearly how plan would work.
May '88	FCC issues detailed price cap plan nearly 300 pages long.
July '88	RBHCs and AT&T express support for new plan, but users and rival carriers criticize, among other things, plan's productivity factor and use of existing rates to set price ceilings.
October '88	Competitive Telecommunications Association, International Communications Association and Consumer Federation of America file motion urging FCC to seek further discussion of plan.
January '89	FCC scheduled to vote on plan, but postpones action due to congressional pressure.

GRAPHIC BY SUSAN J. CHAMPENY

America and operator-assisted and credit card calling services.

Annual increases in the pricing categories, or baskets, will be capped at 3% below the inflation rate. AT&T can raise or lower rates for individual services by 5% a year, as long as the total revenue does not exceed the cap for the category. A special provision limits price decreases for night and weekend MTS services to 4%.

Although Patrick has billed the price caps as pro-consumer regulation, business users may be worse off under the plan, according to observers. Ron Altman, chairman of Altman, Brenner and Wasserman, a Wall Street research firm, said the restrictions on how much AT&T can cut prices — the price floors — will keep users from enjoying the lowest possible prices.

"This is going to put AT&T in a position where they cannot be as aggressive as they would like to be on the price side," Altman said. "If price caps [had been approved] without restrictions on discounting, we would have ended up with very aggressive price cutting."

Page Montgomery, vice-president of Economics and Technology, Inc. in Boston, agreed that by limiting AT&T's ability to lower prices, price caps will not help AT&T stem the loss of large customers.

AT&T issued a statement saying it was



# US Sprint promises global VPN, T-1 upgrades, 800 service boost

BOSTON — US Sprint Communications Co. is expected to roll out an international version of its Virtual Private Network (VPN) service, an international T-1 offering and enhancements to its Ultra800 service by year end.

US Sprint detailed the services at a private briefing here last week for 150 of its current and prospective customers. The carrier plans to hold more than 100 similar briefings throughout the country during the year.

The announcements come just two weeks after US Sprint acquired Private Transatlantic Telecommunications System, Inc. (PTAT) in a deal that gives the company 50% ownership of a transatlantic fiber-optic cable scheduled to be cut over Aug. 1. PTAT is building the undersea cable with Cable & Wireless PLC, which will own the other 50%.

## International VPN

"Through our partnership with Cable & Wireless, US Sprint will offer an international VPN service based on our [current] VPN offering," said Ray O'Brien, president of US Sprint's Eastern Business Marketing Group.

With the new service, which will be announced before year end, US Sprint cus-

tomers can build VPNs that serve sites in the U.S. and the UK, according to Ned Feldman, general manager of international marketing for the carrier.

US Sprint also said it will roll out an all-fiber T-1 service from the U.S. to the UK by year end. "We'll go ahead and provide T-1 first and work on [64K bit/sec] DS0 service later," Feldman said.

## 800 service upgrades

Planned enhancements to US Sprint's 800 service include area-code routing, which allows the user to route calls to different geographic sites depending on the area code of origin, and time-of-day routing, which can be used to direct calls in accordance with time zones.

Other future enhancements will include a call allocator feature that will enable customers with more than one 800 hub to route calls in order to avoid traffic congestion at other sites, according to William Coyne, vice-president/general manager of US Sprint's Northeast Division.

Another enhancement, route advance, will forward incoming calls to other lines when all 800 lines are busy, Coyne added.

— Bob Wallace

# US Sprint reveals ISDN rollout plan

continued from page 1  
services in the first quarter of 1990.

"We will bring our first ISDN [Primary Rate Interface] customers on the network in 1990," said Benjamin Lisowski, technology and architecture strategic marketing manager for Telenet Communications Corp., a division of US Sprint. Lisowski said nine major US Sprint customers have already signed up for the service, but he declined to name them.

"That's an aggressive plan and time frame," said Paris Burstyn, director of telecommunications research and consulting for Business Research Group, a consulting firm in Boston.

US Sprint would not say where it plans to deploy the service first.

## Positive user reaction

Users who attended the strategy briefing were pleased to hear about US Sprint's ISDN plans.

"ISDN is still down the road for us, but it was good to hear that [US Sprint] is working to offer it," said Jack Kilcoyne, assistant vice-president/telecommunications manager for BayBanks Systems, Inc. of Waltham, Mass.

At the meeting, the carrier said it has completed installation of its Signaling System 7 (SS7) network, which now supports 100% of its network trunks. The SS7 network off-loads signaling information required to set up calls from the traffic-bearing network.

SS7 handles the signaling needed to support advanced network services such as ISDN. For long-distance carriers and Bell operating companies, bringing up SS7 is a major step toward commercial availability of ISDN.

The ISDN Primary Rate Interface specifies how customers can use and control a T-1 link configured to CCITT standards to hook customer premises equipment such as private branch exchanges to a carrier's long-distance net.

The ISDN interface delineates how a T-1 link is segmented to support 23 64K bit/sec B channels for voice and data communications and one 64K bit/sec D channel, which is used to control the B channels and to carry packetized data.

US Sprint operates a nationwide,

20,000-route-mile fiber-optic network with Northern Telecom, Inc. DMS-250 digital central office switches.

A customer with a Northern Telecom Meridian SL-1 equipped with the switch maker's Primary Rate Access software interface will be able to link the PBX directly to a DMS-250 central office switch equipped to support the Primary Rate Interface. However, a customer with an AT&T System 85 will not be able to gain direct access to the central office, Lisowski said.

## Converter box

"We are planning to deploy the interface using a converter box that will translate AT&T's [Primary Rate Interface] into Northern Telecom's version of [the interface]," Lisowski said. The converter will be located adjacent to the Northern Telecom switch in every US Sprint central office, he added.

The boxes will convert messages sent by the AT&T System 85 in a protocol known as Q.931 over the ISDN D channel into the Q.931 protocol supported by Northern Telecom SL-1s.

Messages sent in Q.931 over the D channel and through the US Sprint SS7 network determine the status of a remote telephone line without tying up a trunk line between network switches.

Although both vendors' message protocols comply with the current CCITT specification, they differ somewhat, Lisowski said. "Every [PBX vendor] has implemented the ISDN interface in a slightly different manner."

US Sprint began testing ISDN in its laboratories located in Burlingame, Calif., more than a year ago, according to Lisowski.

"We currently have a DMS-250 equipped to support ISDN [Primary Rate Interface] connecting to an SL-1 PBX [with a Primary Rate Access interface]," he said. "Various types of terminal equipment are attached to the switch." An AT&T System 85 with a Primary Rate Interface is hooked through the converter box to the ISDN central office, and it supports several terminal devices.

Lisowski said US Sprint will eventually work to connect other vendors' PBXs to the Northern Telecom central office, but he declined to say which switch would be tested next. □



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# Multivendor demos top bill at CeBIT expo

continued from page 6

The MultiNET absentees joined other OSI promoters in the so-called EuroSInet demonstration. OSI products from 24 vendors were linked in a network simulating a multinational commercial enterprise.

Purchase orders, shipping documents, inventory-tracking information and financial transactions were transmitted among booths at the show and elsewhere around the world over an X.25 packet network.

In addition to demonstrating OSI's File Transfer, Access and Management, EuroSInet participants utilized the X.500 electronic mail directory system and the Electronic Data Interchange For Administration, Commerce and Trade standards.

Many of the products shown, however, were prototypes. Among the participants in EuroSInet were DEC, IBM, NCR Corp., Prime Computer, Inc., Siemens, Tandem Computers, Inc. and Unisys Corp. The demonstration was organized and funded by EuroSInet, a vendor association; OSI-

TOP, a European user organization devoted to the promotion of OSI standards for communications; and the Commission of the European Economic Community.

Yet another multivendor OSI demonstration at CeBIT featured the CCITT's Office Document Architecture and Interchange Format (ODA). ODA is designed to enable the exchange of electronic documents over an X.400 network without the need to alter the format of the original text and graphics. IBM showed an ODA interface for its Professional Office System software running under VM.

The demo was the fruit of a project funded within the framework of the European Economic Community's Esprit research and development program in information technologies. While only prototype ODA implementations were presented, one of the participants said the firms hoped to show commercially available products at next year's CeBIT.

Compiled from reports by Bruce Guttill, Network World Features Writer, and Amltel Kornel, IDG News Service.



## NCR Comten delivers new line

continued from page 1

512 full-duplex lines, while the 5665 and the 5675 have 16M bytes of memory and support up to 1,024 lines.

In addition, the 5655 and 5665 processors can each support 16 active T-1 lines, while the top-of-the line 5675 processor can directly terminate up to 24 T-1 lines, all of which can be active, Brantley said.

IBM's 3745 can terminate 16 T-1s, he said, but only eight can be active at one time.

With Release 4 of NCR Comten's COS2, the operating system for NCR Comten processors, each of the new processors can support as many as eight active mainframe channels. Release 5 of COS2, due out in the third quarter, will enable the 5675 to support up to 16 active mainframe channels, Brantley said.

The processors also run NCR Comten's Network Control Program (NCP) Version 4.2 under COS2. NCR Comten's NCP Version 5, due out at midyear, will be NCR Comten's answer to IBM's current Version 5.1 of NCP, said Ronald Groenke, vice-president of development at the company.

IBM's 3745 running NCP Version 5.1 can already support 16 active mainframe channels, but only eight of those channels can be linked to mainframes capable of controlling NCP. The other channels do not have the full

VTAM capabilities, Brantley said.

IBM supports peer-to-peer networking of PU 2.1 nodes under its NCP Version 5.1, a capability NCR Comten will match with its next version of NCP, according to Groenke.

### The power of one

The increased power of NCR Comten's processors stems from their single-processor design, Groenke said. The new models offer up to 2½ times the performance of comparable IBM models, he added.

Upgrading the new NCR Comten front ends involves swapping processors, whereas IBM upgrades its 3745 from a Model 210 to a Model 410 by installing a second processor. With IBM's design, users must determine what net resources are controlled by which processor, meaning it is possible for one processor to be overloaded, he said.

NCR Comten's single-processor strategy eliminates the need to assign areas of responsibility, resulting in increased performance and response times, Groenke said.

The increased power will enable users to support more terminal sessions than the IBM processors while providing the same response time.

As with NCR Comten's current 5660 front-end line, customers can use one of the new processors as a hot backup for multiple other front ends. By contrast, an IBM 3745 can back up only one other

processor, Brantley said.

Each of the new processors supports an array of protocols, including Synchronous Data Link Control, LU 6.2, asynchronous, Binary Synchronous Communications, X.25 and X.21, as well as interfaces for token-ring local networks.

The processors come configured with an 80M-byte hard disk that enables users to store multiple network configurations. In the event of a processor failure, configuration data can be downloaded to the backup processor using NCR Comten's Overview control facility.

According to Frank Dzubeck, president of the Washington, D.C.-based consultancy Communications Network Architects, Inc., NCR Comten's new processors continue the company's tradition of producing more powerful processors than IBM. But, he said, the idea of using one machine to back up many others does not solve the problem of providing redundancy in a front-end processor.

"They're trying to fix the result, not necessarily the problem," Dzubeck said. "The problem is the lack of a fault-tolerant front end."

Scheduled to ship in April, prices start at \$122,100 for the NCR Comten 5655, \$187,000 for the 5665 and \$254,000 for the 5675. Support for nine to 16 mainframe channels as well as T-1 will be available in the third quarter. □

## Sears picks US Sprint as carrier

continued from page 3

Communications Co. ("Sears network unit widens its portfolio," NW, Feb. 13).

Sears is moving voice traffic from its private net to US Sprint in an effort "to cut costs and improve its interaction with customers," a source at Sears said.

Cost-cutting is a high priority for Sears, which recently reduced prices on all of its products to improve sales. "This is very much an effort to support our company's everyday low pricing strategy," the Sears source said.

Falling long-distance rates have made public voice services more attractive to Sears, according to another source familiar with the contract.

### Expanded 800 services

Sears plans to improve customer service by greatly increasing its use of 800 services on a corporatewide basis, but such services could not be supported by the company's private network without great expense, the source said. "Why build it yourself when you can buy it from someone else for less?" the source said.

Sears could have supported 800 services via its private network if it was upgraded, but the network could not support the Signaling System 7 (SS7) capabilities inherent in US Sprint's network, the source said. □

## Calendar

**April 2-5, New Orleans — NACHA '89.** Contact: National Automated Clearing House Association, 607 Herndon Pkwy., Herndon, Va. 22070; (703) 742-9190.

**April 3-4, Chicago — Telecom Auditing A-Z.** Contact: United Communications Group, 4450 Montgomery Ave., Suite 700N, Bethesda, Md. 20814; (301) 961-8700.

**April 3-4, Baltimore — Principles of EDI.** Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138; (216) 243-6900.

**April 3-5, Boston — Object Orientation: Defining the End-User Platform for the '90s.** Contact: Patricia Seybold's Office Computing Group, 148 State St., Suite 612, Boston, Mass. 02109; (617) 742-5200.

**April 3-6, Boston — TCP/IP OSI/ISO ISDN Internetworking Tutorials.** Contact: Advanced Computing Environments, 480 San Antonio Road, Mountain View, Calif. 94040; (415) 941-3399.

**April 3-7, Washington, D.C. — OSI Training Course.** Contact: Omnicom, Inc., 115 Park St. SE, Vienna, Va. 22180; (703) 281-1135.

**April 4-5, Chicago — Making Incoming Call Centers Pay Off.** Contact: *Business Communications Review*, 950 York Road, Hinsdale, Ill. 60521; (800) 227-1234.

**April 4-6, Dallas — Data Communications II.** Contact: International Communications Association, 12750 Merit Drive, Dallas Texas 75251; (214) 233-3889.

**April 5-12, Hannover, West Germany — Hannover Fair.** Contact: Hannover Fairs USA, Inc., 103 Carnegie Center, Princeton, N.J. 08540; (609) 987-1202.

**April 5-7, San Diego — Telecommunications Costing in a Dynamic Environment.** Contact: Bell Communications Research, Inc., 290 W. Mt. Pleasant Ave., Livingston, N.J. 07039.

**April 6-7, Atlanta — VSAT Networks.** Contact: JKR Associates, P.O. Box 116, Melbourne, Fla. 32902.

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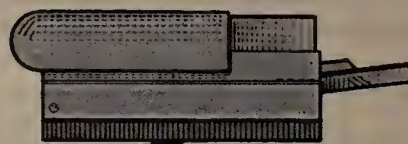
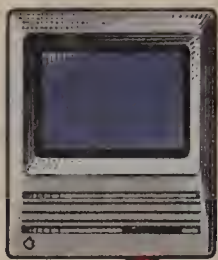
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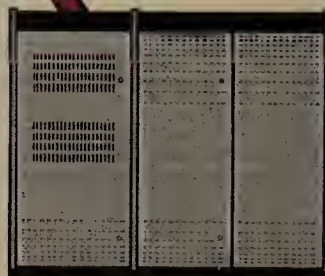
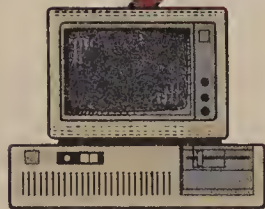
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